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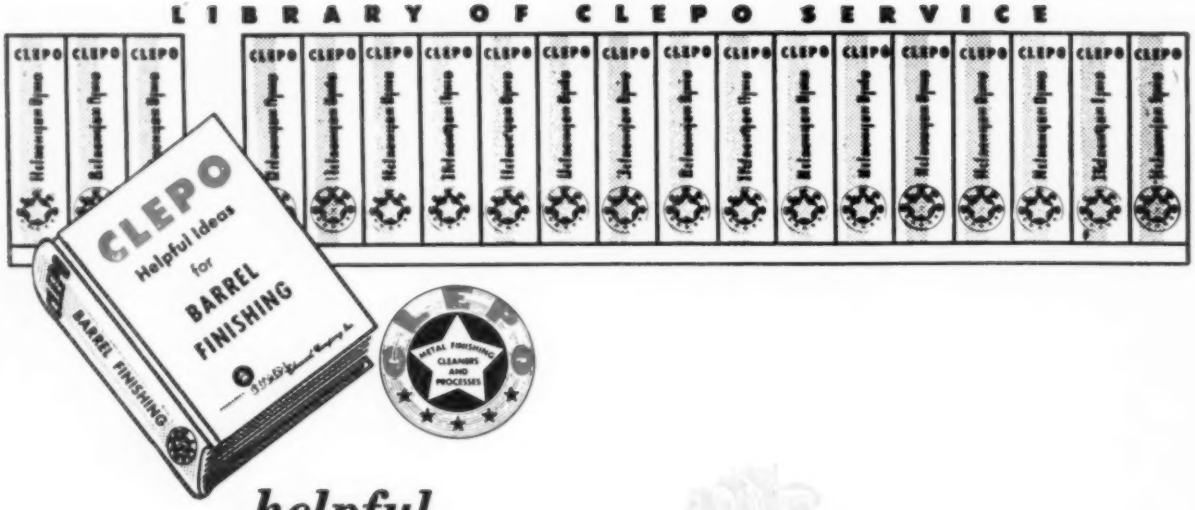

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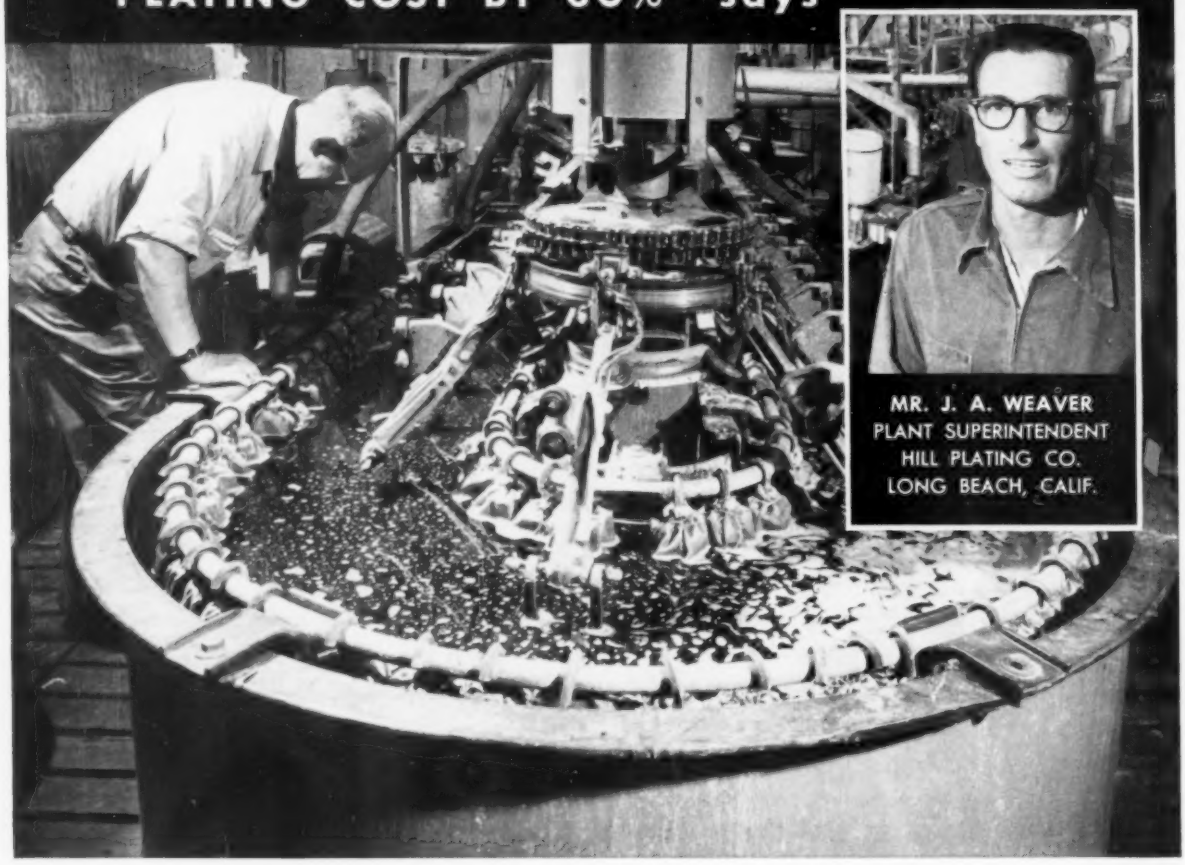

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Journal of the American Electroplaters' Society

January 1958 — **Vol. 45, No. 1**

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EDITORIAL

WHAT'S NEW ABOUT 1958?

IT IS USUAL at the beginning of each new year to pause, however slightly, to appraise our position and map new progress.

As citizens of the United States, Canada, Australia and the Free World, we must guard against all those who would usurp our freedom with everything we have to enjoy; as members of AES, we must add to the scope of scientific knowledge by research, communication and action. But this is as before.

What is new about 1958? The challenge is new! The dedication is new! The frontier of knowledge will be pushed back a little further. As each day passes we will stand on new ground. As each mile goes by we may look around, but we will want to go on.

As much as it looks the same, then, 1958 *is* new and the *need* is greater. With emphasis on those things which make for success we can and *will*, make a better home, a better job, a better AES, a better country and a better world.

Don't take 1958 for granted! Don't say that there isn't anything new about it. Let's give what there is within us to give—for through giving *and* doing, we make all our worlds brighter.

Happy New Year!

Francis J. Eddy

President

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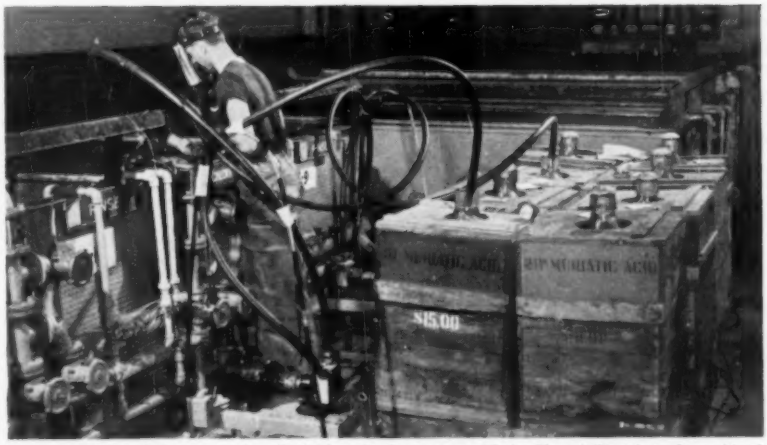
*Reg. trade mark of Minn. Mining & Mfg. Co.

Reprint Available:

Plastic Pump Handles Etch Solution

Four-page article reprint describes how sealless plastic pump solved the problem of conveying a ferric chloride etch solution in the printed-circuit plant of a large electronic parts manufacturer. To obtain, write for REPRINT #w11

HCl, HF and H_2SO_4 no match for Sealless Plastic Pumps



Vanton sealless plastic pumps handle HCl and other conc. acids in Chem-Mill etch tanks at North American Aviation's Columbus, Ohio, plant.

Unique pump design means no acid leakage at North American Aviation, Inc.'s Chem-Mill etching tanks

Two 5-gpm Vanton plastic sealless pumps are solving acid handling problems for North American Aviation, Inc., at its Columbus Division jet-fighter plant in Columbus, Ohio. The acids—nitric acid, hydrofluoric acid, sulfuric acid, and hydrochloric acid—are used for the new Chem-Mill chemical etch milling process developed in 1953 by North American.

Main advantage of the new chemical etch-milling technique is that it permits fast, economical removal of excess metal from out-of-the-way spots without endangering part strength. Presently used on aluminum tube, sheet, and forgings, its application is due to be expanded by North American to over 400 aluminum airplane parts, including such things as tapered fuselage skins, access doors, duct skins and leading edges of wings and stabilizers.

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Capacities of the Vanton sealless plastic pump range from ½ to 40 gpm. Liners and housings are made in a variety of plastic materials, to suit a wide range of corrosive, acid, and slurry conditions. For further details, write for CATALOG 101.

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A NEW YEAR'S MESSAGE TO PLATING'S ADVERTISERS, ADVERTISING AGENCIES AND PROSPECTIVE ADVERTISERS

CUSTOMARILY, PLATING's popular CONVENTION ISSUE is its June issue. This year, however, the Annual Convention of the American Electroplaters' Society (AES), its parent, will be held in Cincinnati, Ohio, in May not June. Hence, the CONVENTION ISSUE will be the May 1958 issue, not the June issue as usual.

The 1958 issue is already in the making. Not only will it carry a variety of original technical and scientific articles, created by experts, that, as usual, will have passed the critical scrutiny of other experts as anonymous, impartial "reviewers" before acceptance for PLATING publication, but it will also mount fullest possible coverage of 45th Annual Convention data, including, exclusively, the Society's narrative/pictorial annual report to its large and farflung membership.

It will carry its usual departmentized sections commanding wide readership, including news of its 57 Branches in the United States, Canada and Australia prepared specifically by Branch Secretaries for the AES's own PLATING Magazine.

PLATING's circulation is bourgeoning steadily forward. From President to Foreman, responsible electroplating, metal finishing and related company personnel are individual members of the AES and are, therefore, issue-after-issue, year-after-year, readers of PLATING inasmuch as annual AES membership fee includes annual PLATING subscription. PLATING circulation is consequently firm, sure circulation—and increasing commensurately with the Society's sizable annual membership growth, and with PLATING's reputation among non-members.

In the last five years, AES membership swelled by some 1607 members, meaning a nearly 30 per cent growth. During that same period, PLATING's paid circulation mounted by 1779 member and non-member subscribers for an approximately 26 per cent rise—and expanding steadily.

PLATING's nearly 9400 current over-all circulation, geographically, means approximately 84 per cent United States; 5 per cent Canadian; 11 per cent foreign. Automotive; aircraft; electrical apparatus; industrial equipment and machinery; plated ware; precision instruments; tool and machine are but a few of the industries reached by PLATING.

We value, appreciate, solicit your monthly advertising. We hope that you will use PLATING to the limit. And if you have not yet scheduled for the CONVENTION ISSUE, we earnestly urge doing so promptly inasmuch as demand for space is accelerating. Communicate with Harry A. Johnston, Advertising Manager, here, or with Bob Wettstein and Associates, our Western Advertising Representatives, if you are a West Coast company. Their mission is to assist you to take full advantage of the vast purchasing power served by PLATING.

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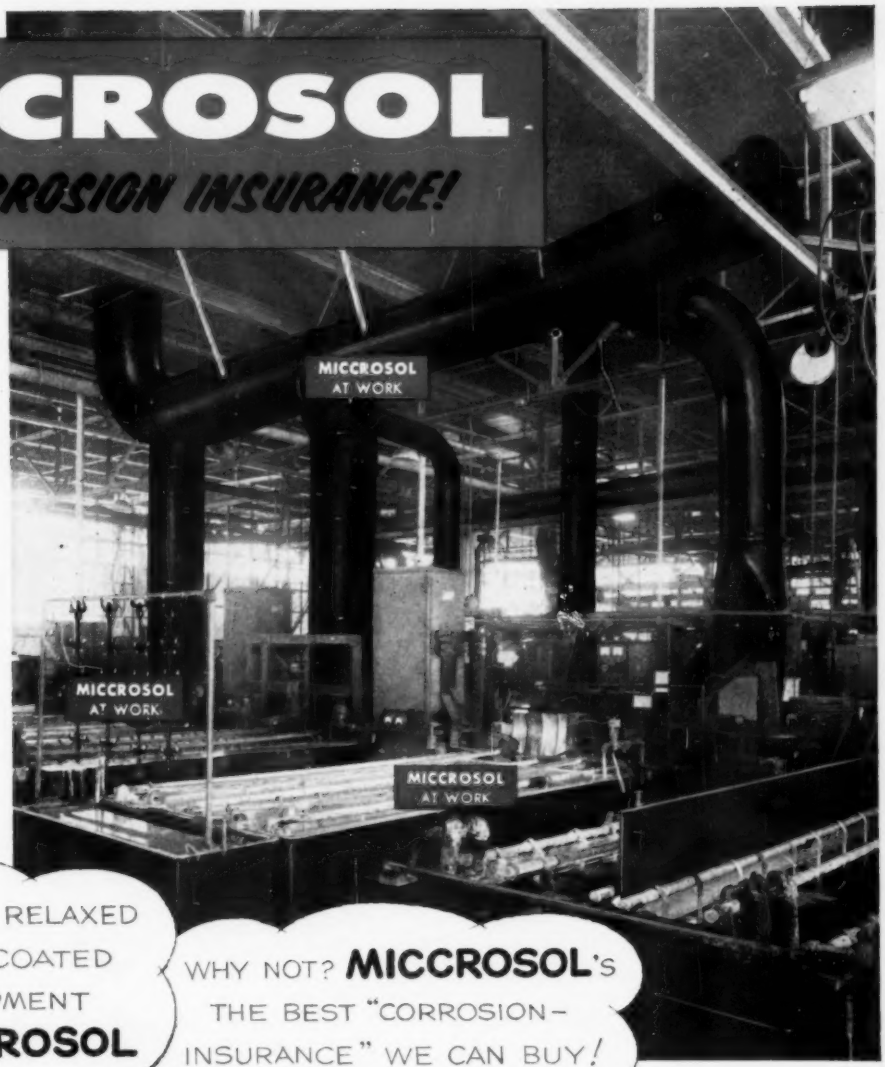

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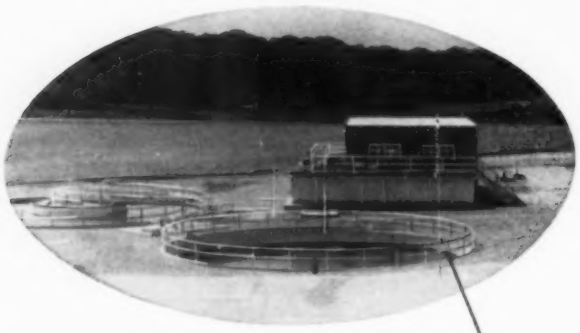

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CONTAINING a full record of the 44th Annual Convention of the American Electroplaters' Society (AES) held in Montreal, Canada, June 17–20, 1957, the AES's 1957 Edition of TECHNICAL PROCEEDINGS has made its appearance, and members' copies are issuing to AES members globally.

It publishes in full each of the technical papers delivered by experts at the six Educational Sessions of that fertile 1957 Convention, including their charts, diagrams, graphs, tables and other illustrations, plus the verbatim discussion that followed their delivery. A veritable treasure chest of technical information, the document enriches technical and scientific knowledge in the field of electroplating, metal finishing and allied arts.

In addition, the book provides a narrative/pictorial account of the Convention itself, and a summary of transpirings. It includes, moreover, an up-to-date listing of 1957–1958 AES Boards and Committees, and presents a full directory of the Society's 57 Branches in the United States, Canada and Australia.

This book is the only printed medium in which all of the 1957 Convention's technical papers, and the wealth of technical and scientific data that they impart, will be published. Its scope and coverage are demonstrated by its array of papers listed below.

AES headquarters has received many inquiries from non-members regarding the availability of copies of this 1957 book for purchase, and its market price.

Because of the stature of members' needs, only a comparatively limited quantity of this 1957 Edition of TECHNICAL PROCEEDINGS exists for sale to non-members. In a spirit of cooperation with non-members who, recognizing the book's import and value, desire copies, their orders will be accepted and processed by the AES *on strictly a first-come first-served basis so long as the AES's limited supply lasts.*

The domestic price of the 1957 Edition of TECHNICAL PROCEEDINGS is $10 per copy including postage. To those ordering from outside of the United States' continental limits, the charge is $12 per copy including postage. *All orders must be accompanied by payment in full so as to obviate unnecessary bookkeeping expense.* Address orders and make checks payable to:

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In these days of a rising and falling nickel market, you're smart to keep every nickel anode working in its *designed position.* Nickel spears, swords and stubs *not* in the bath—or improperly placed—eat into your fair profit and it's important you put that scrap back to work turning nickels into dollars. The answer, as proved by hundreds of satisfied customers in the past ten years, is *recasting.*

Wagner Brothers, pioneers in nickel anode recasting, offer you an opportunity to regain your rightful profit. Our reputation is your assurance of highest metal quality, low dross loss and turnaround delivery and the cost of this service is pennies per pound. To get started on the road to cost reduction, simply fill out the coupon below. The detail you furnish us will expedite proper handling of your order.

COUPON

WE HAVE ELECTROLYTIC NICKEL ANODE SCRAP FOR RECONVERSION

Stubs, average length ..... _____ inches; weight (less hooks) ..... _____ pounds

Swords, average length..... _____ inches; weight (less hooks) ..... _____ pounds

Shipment can be handled in ☐ strapped bundles ☐ drums ☐ by rail ☐ by truck

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MANUFACTURERS AND PROCESSORS OF ALL METAL-FINISHING CHEMICALS, ANODES, AND EQUIPMENT

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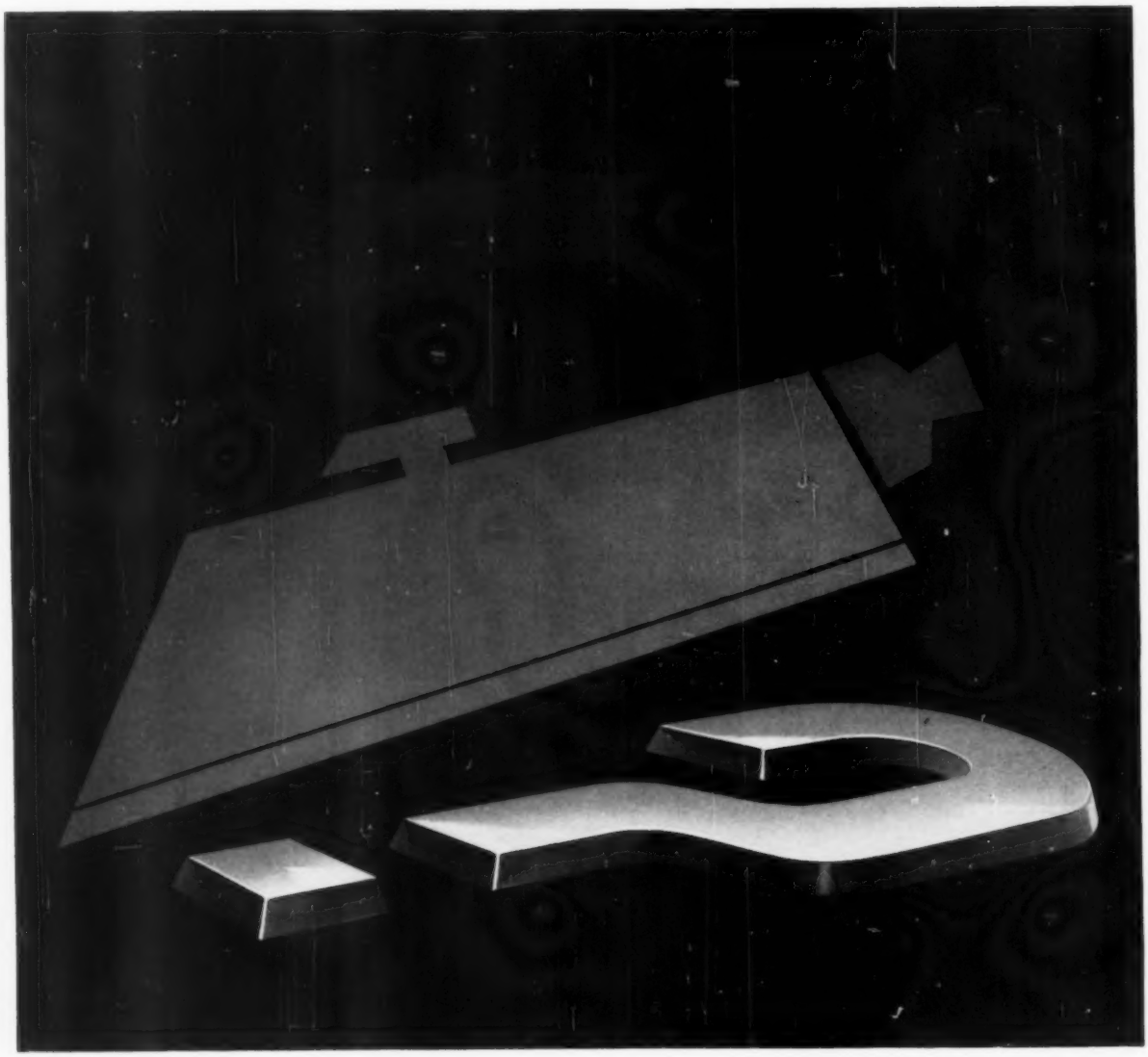
CHICAGO • CINCINNATI • CLEVELAND • INDIANAPOLIS • NEW YORK • ROCHESTER • GRAND RAPIDS

Wagner BROTHERS INC.



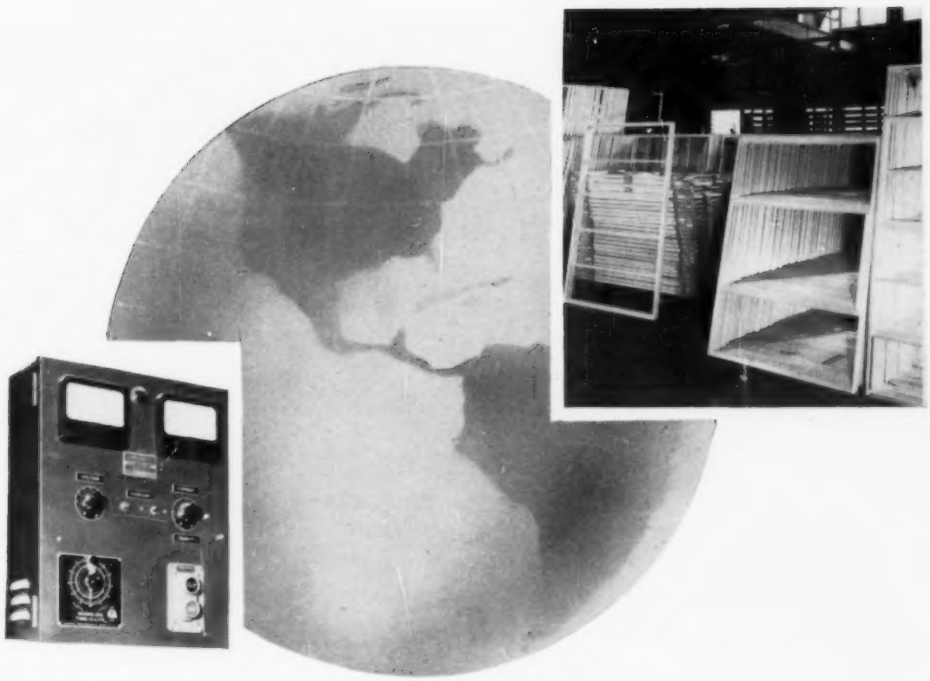
Iron out your chrome-plating problems with Diamond

Let DIAMOND's technical specialists go to work on your chrome-plating problems. These men work full time on customers' questions. They come up with complete, profit-making answers. Their service is free.

In producing chromic acid, DIAMOND controls *every* processing step to safeguard quality. DIAMOND experience starts with importing the chrome ore and making the soda ash, and extends through production and delivery. It even includes standing by your side, if you wish, to help you get top-quality plating results and keep costs low.

DIAMOND facilities—two chromic acid plants and nine warehouses and sales offices across the country—assure you uninterrupted supply and dependable service. DIAMOND ALKALI COMPANY, 300 Union Commerce Building, Cleveland 14, Ohio.

Diamond Chemicals



"There's a world of difference in Anodizing when you have Automatic Current Density Control" . . .

. . . says John Gurniak of

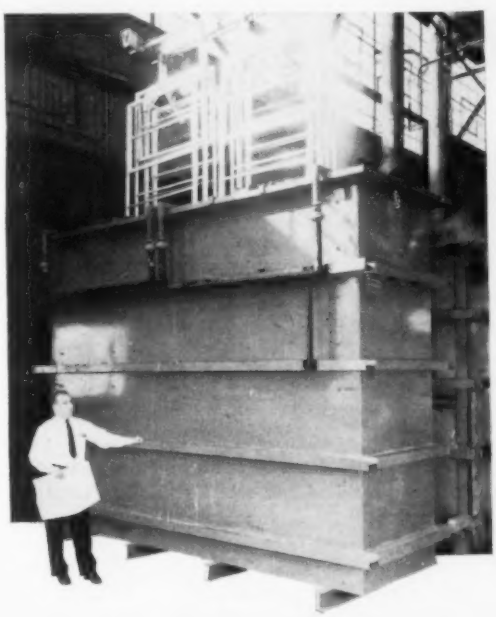
MICHAEL FLYNN MFG. CO., PA.

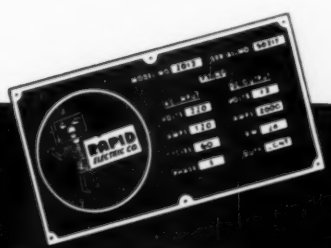
"and that big difference is the accuracy and simplicity in which a pre-determined film thickness can be controlled."

"We chose RAPID ELECTRIC'S Automatic Current Density Control rectifiers to eliminate the problem of estimating current densities with each load change. One setting, and the rectifier automatically maintains a constant current density per square foot of work."

"It's that easy".

"Once more, with the possibility of over-current virtually eliminated, MICHAEL FLYNN'S high standard of quality is assured."



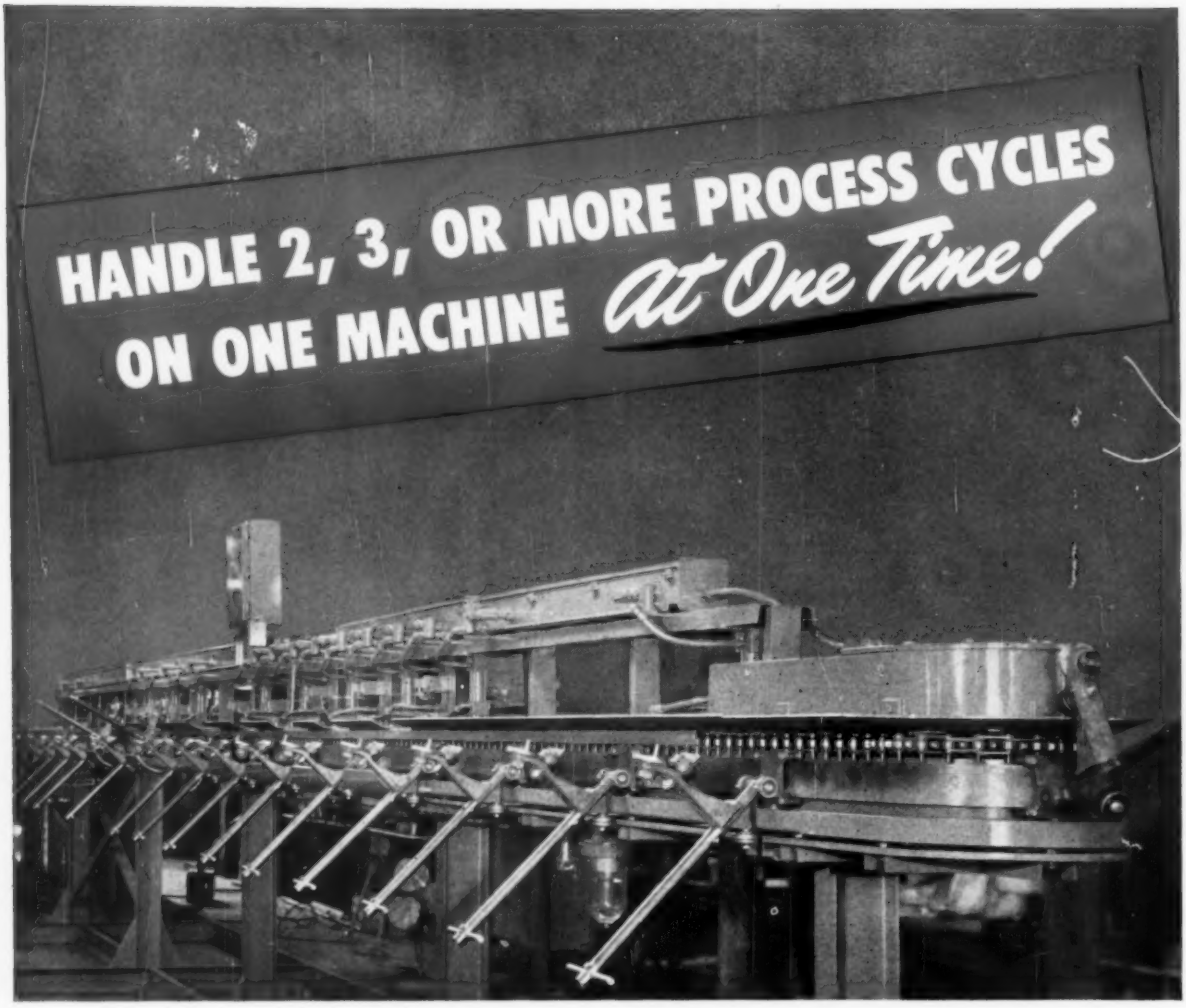


THE NAMEPLATE THAT MEANS *"More Power to You!"*

RAPID ELECTRIC COMPANY

12838 Fenkell Avenue • Detroit 27, Mich. • Diamond 1-8537

2881 Middletown Road • New York 61, N. Y. • TAlmadge 8-2200



LASALCO'S *Select-O-Matic*

MULTIPLE PROCESS PLATER

Another Lasalco development that offers the industry the last word in *fully automatic* plating!

With the new Select-O-Matic, the operator simply selects the desired process cycle for individual racks, when loading the machine, merely by turning a dial on the carrier. From that point, the rack *automatically* travels through the entire selected cycle without further attention.

A single Select-O-Matic plater, manned by one operator, will handle several various processes simultaneously. Different machines for each process are eliminated—original investment in equipment is greatly reduced—much less floor space is needed—maintenance is cut to an absolute minimum.

The Select-O-Matic is easily adaptable to any operation. Tell Lasalco about *your* operation and requirements to learn what this new machine can do for *your* production and profits.

Write Today!

LASALCO, INC.

HOME OFFICE: 2820 LaSalle St. • St. Louis 4, Mo. • PRospect 1-2990
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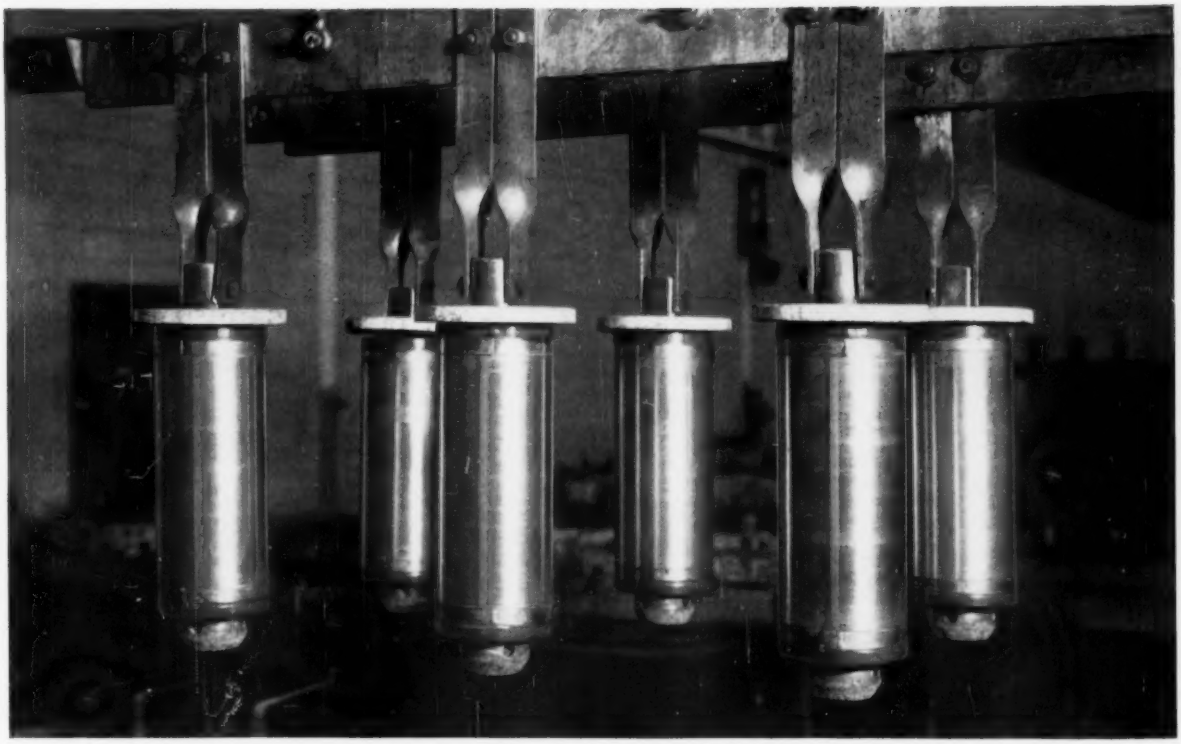
FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 112.



These six arbors of piston rings have just emerged from a chrome plating bath at the Koppers Company's Baltimore plant. Consistently low sulfate content of Mutual Chromic Acid helps insure flawless finish on critical parts like these.

To insure a uniform, flawless chrome finish use

MUTUAL *LOW SULFATE* CHROMIC ACID

When chrome plating must be perfect – when anything less means a profit-eating reject – you can rely on Mutual Chromic Acid to reinforce your technical skill.

Mutual Chromic Acid is always 99.75% pure – or better. Sulfate content never exceeds 0.1%. This consistently low sulfate content of Mutual Chromic Acid makes it easy for you to control the acid-sulfate ratio of your plating bath. It is your insurance against plating difficulties.

Send today for the free Mutual booklet, "Chromium Chemicals," which contains useful technical information about the entire line of Mutual chromium chemicals. A Technical Service Staff is also available, to offer help or information at any time.

Mutual Chromium Chemicals

MUTUAL

Sodium Bichromate
Sodium Chromate
Chromic Acid
Potassium Bichromate
Potassium Chromate
Ammonium Bichromate
Koreon (One-Bath Chrome Tan)

MUTUAL CHROMIUM CHEMICALS
SOLVAY PROCESS DIVISION
Allied Chemical & Dye Corporation
61 Broadway, New York 6, N. Y.

Allied Chemical

Please send me Bulletin #52–Chromium Chemicals–Their History, Properties and Uses.

NAME_____ POSITION_____

COMPANY_____

STREET_____

CITY_____ ZONE____ STATE_____

P 3-8-1

Platers find many uses for chelating *cleaner

*Chelating (pronounced key-lating) cleaners convert metallic salts and oxides into compounds soluble in water.

By chelating and removing rust or heat scale at the same time that it removes oil, Oakite Rustripper combines pickling and alkaline cleaning into one operation. It also avoids disadvantages of acid pickling, such as hydrogen embrittlement and etching of machined surfaces.

Platers now use Rustripper for dozens of difficult steel-cleaning jobs. Here are some examples reported in recent weeks:

CALIFORNIA: "Rustripper has ended pickling damage such as embrittlement." (Removing oil and light rust from machined landing gears before cadmium plating.)

NEW YORK: "Now saving about $10.40 per day on removing rust and scale and producing brighter plate." (Rustripper, added to reverse current cleaner in automatic plating machine, has eliminated separate pickling of wire towel racks before nickel and chrome plating.)

CONNECTICUT: "Rustripper added to reverse current cleaner has eliminated troublesome smut from metal furniture prior to copper-nickel-chrome plating."

NEW YORK: "Rustripper very good in barrels for derusting and brightening business machine parts . . . also for removing brown stains from parts put through black oxide treatment."

NEW YORK: "Small steel aircraft parts were embrittled by acid pickling. Rust, heat scale and stains are now safely removed by Rustripper and cyanide."

NEW JERSEY: "Only two cleaning rejects in first 15,000 parts plated." (After Rustripper was added to reverse current cleaner in automatic plater to eliminate smut from tubular steel furniture.)

INDIANA: "Rustripper is the best barrel compound we ever used for this job." (Removing tough heat treat scale from steel screws.) "Total cleaning and zinc plating time has been cut in half."

NEW YORK: "Had trouble with light rust on business machine parts before cadmium plating; also with smut left after electrocleaning. Rustripper cured both troubles."

FREE A 14-page illustrated booklet called *"Here's the best shortcut in the field of electroplating"* tells about many ways in which Oakite Rustripper can be of great value in the plating shop. Write to Oakite Products, Inc., 40 Rector St., New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS · METHODS · SERVICE
SCIENCE

Technical Service Representatives in Principal Cities of U. S. and Canada
Export Division Cable Address: Oakite

A Timely Message on
Ad Writing by Canines

That's Me!

by Sox von Liebestraum Sax
Ex Detroit Rep. and Assistant to
Ben P. Sax, **Chairman of the Board**
American Buff Company

How I long for the "good ol' dog days." No one then would have thought of asking me, Sox von Liebestraum Sax—dog of distinction and trusted assistant to Ben P. Sax, Chairman of the Board of American Buff Company—to write an ad selling the world's greatest buffs.

Being a sharp-witted gray-flannel type, I pointed out that practically everybody and his canine was already using American Buffs. What else would make American Buff Company the No. 1 manufacturer in the business? We don't need to advertise, said I.

Nobody disputed that American was the No. 1 buff in quality and sales. So they took a different tack—appealed to my canine vanity. Show them how superbly you handle the English language, someone suggested. I yielded.

Take a tip from this ad-writing canine: Check the terrific results users are getting with American—little things like increases as high as 100% in output. Get the full story from your American Buff "Rep" and buy some—you know who gets the axe if this doesn't sell!

Cordially,

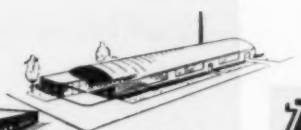
Sox von Liebestraum Sax

"For the Job that's TOUGH... use an AMERICAN BUFF"

World's Largest Manufacturer of Buffs and Polishing Wheels for Every Finishing Operation

PATENTED CENTERLESS OR PERMANENT CENTER CONSTRUCTION

PLANT NO. 1



PLANT NO. 2

PLANT NO. 3

American Buff Company

2414 S. LaSalle St., Chicago 16, Illinois • CAlumet 5-1607

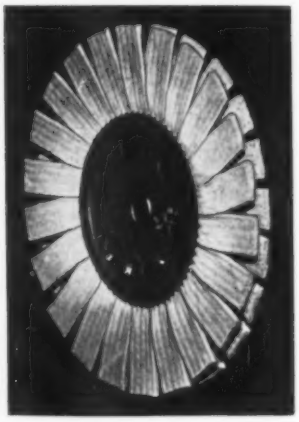
AMERICAN BUFFS ARE REGULARLY ADVERTISED IN FORTUNE MAGAZINE

L'HOMMEDIEU
Everything for Plating and Polishing

KUL-KUT BUFFS

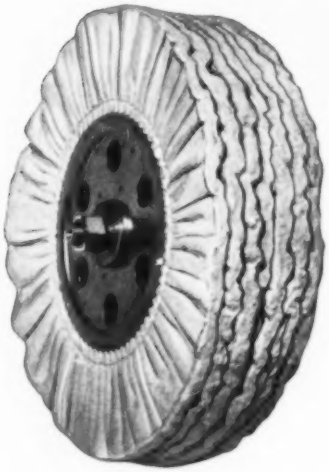
BIAS TYPE • STEEL CENTER • FULLY VENTILATED

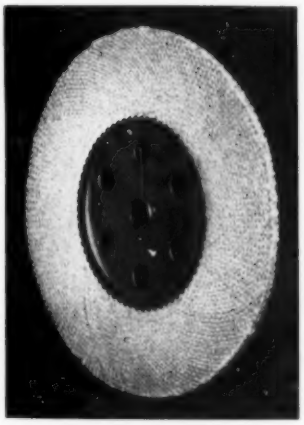
Particularly adaptable to semi and full automatic operation



KUL-KUT Segment Buff
(cloth or Sisal)
for polishing
and/or buffing
parts having contoured
surfaces

Longer life—
More parts buffed with
less compound
Fully ventilated and
cooler operating
Pre-tested, accurately
balanced & ready faced
For added safety—one
row of extra heavy
concentric sewing close
to center plate





KUL-KUT Sisal Buff
for cut and color
in one operation
on plain or
stainless
steel

A complete line of air-cooled bias type buffs for every need
Additional information and prices will be supplied on request—a trial will prove conclusively that KUL-KUT BUFFS are the most economical to use

BUFFING COMPOUNDS EXTRUDED ANY SIZE TO FIT YOUR APPLICATION

Chas. F. L'Hommedieu & Sons Co.

MANUFACTURERS of

Plating and Polishing Machinery

Complete Plating Plants Furnished

Chas. B. Little Co.
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and
Los Angeles

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 116.

Cleaning Specialists*

*[SPE'CIAL·IST—One who devotes himself to some special branch of activity.]

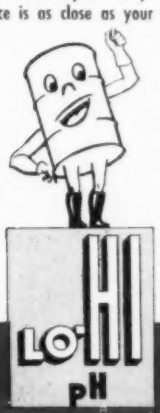
At Northwest our "special branch of activity" is solving your cleaning problems.

Behind your friendly, competent Northwest Sales Engineer stands a reputation for providing industry with low-cost, analytically-correct, job-adjusted chemical cleaners.

From Northwest's years of experience in formulating the RIGHT cleaner for your specific needs have come such developments as the LO-HI pH PROCESS—for cleaning prior to plating, painting, or vitreous enameling; ALKALUME PROCESS—for preparing aluminum and magnesium for finishing and spot welding; INTERLOX PROCESS—for phosphate coating; SPRA-LUBE—to control over-spray of "today's" paints in water wash paint booths; PAINT STRIPPERS—specific to your needs; SUPER-DRAW & FLUID FILM—for drawing metals.

Remember—YOUR COST PER FINISHED ARTICLE IS THE TRUE COST OF YOUR CLEANER.

Northwest's production-tested chemicals and "Right the first time" recommendations will save you money. Northwest Service is as close as your phone.



Northwest products are manufactured on the west coast by—

ALERT SUPPLY COMPANY • Los Angeles

NORTHWEST CHEMICAL CO.

9310 ROSELAWN DETROIT 4, MICH.

pioneers in pH cleaning control ... serving you since '32

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HOST: AES
INDIANAPOLIS BRANCH

INTERIM MEETING REPORTER

HOTEL MAROTT
INDIANAPOLIS, IND.
JANUARY 11, 1958

RECORD BRANCH REPRESENTATION EXPECTED AT FIFTH INTERIM MEETING

BRANCH DELEGATES and Alternates from various sections of the United States will converge upon Indianapolis, Indiana, January 10–11, 1958 to attend the full-day Fifth Interim Meeting of the Supreme Society of the AES that will be held at the Marott Hotel there Saturday, January 11. A compact yet comprehensive Agenda will guide the discussion, and the meeting is expected to serve as a sounding board on some subjects likely to be considered and acted-upon by the Annual Meeting of the Supreme Society, the AES's governing council, to be held in Cincinnati, May 22, 1958.

Interim Meetings Now Mandatory

Interim Meetings of the Supreme Society were first conceived in 1951, and the first such meeting was held in Philadelphia that January. The second such meeting was held in Columbus, Ohio, in January 1953—the third, in Toronto, Canada, in 1954. There was a lapse in 1955, then revival in 1956 when a successful Fourth Interim Meeting was held in Pittsburgh, Pennsylvania, last January with a record-breaking attendance.

The importance of Interim Meetings to the Society's government was given pungent expression by the Supreme Society at its Annual Meeting in Montreal, Canada, last June, when that assembly unanimously adopted a Bylaw amendment making the conduct of an annual Interim Meeting mandatory, and vesting the responsibility of setting its date and naming its locale, in the Supreme Society itself instead of in the Executive Board. It excepted this year's Interim Meeting by delegating authority to name site and date to the Executive Board. After inviting Branches to bid for assignment as Host Branch, the Board, at its September 1957 meeting, selected the Indianapolis Branch from among vying Branches.

Composed of three accredited Delegates from each of the AES's 57 currently chartered Branches, the Supreme Society is the AES's summit governing and policy-making council. It legislates at its Annual Meeting, and by official letter ballot as the occasion requires during the year. It is also empowered to legislate when called to Special Meeting pursuant to the provisions of the Constitution. The Interim Meeting, however, is powerless as a legislative assembly. Its sole prescribed purpose is to hear reports and proposals; to consider all matters referred to it by the Annual Meeting; finally, to make recommendations to the Annual Meeting and the Executive Board concerning these and other matters coming before it.

The Weekend's Full Schedule

The Executive Board will convene in regular session on Friday, January 10, at the Marott Hotel, Indianapolis, and will continue its regular meeting on Sunday, January 12.

Delegates, Alternates and National Officers will be guests of the Indianapolis Branch at a special Branch Meeting to be held at the same hotel starting about 8 p.m. on Friday, January 10. The meeting will be preceded by a "Dutch Treat" dinner starting at about 6:30 p.m.

The Interim Meeting itself will commence sharply at 10 a.m. Saturday, January 11 and will continue to late afternoon adjournment. It will recess for a "Dutch Treat" luncheon tastefully arranged by the Host Branch. The entire assembly will be guests of the Society itself at a cocktail party to follow immediately after adjournment of the Interim Meeting.

The Interim Meeting will be welcomed to Indianapolis by Branch President Bert Hawhee. National President Francis T. Eddy will keynote the meeting and preside throughout it. All other National Officers will be present and will report as assigned in the Agenda that is presented elsewhere on this page.

A dynamic AES Branch with a bright history of Society service, the Indianapolis Branch has exerted every effort to provide an effective setting and background for this Supreme Society assembly. Branch arrangements leadership has been provided by M. L. Whitehurst, General Chairman; M. Lester Reynolds, Reservations and Housing; Edward Bruck, Registration; Quentin Shockley, Branch Dinner and Interim Meeting Luncheon; Elmer Lundberg, Equipment and Notices; Roman Bender, Cocktail Party and John Holland, Finance.

Meeting's Minutes To Be Published

Mrs. Florence K. Marquardt, veteran of 21 Annual Meetings and 4 Interim Meetings, will serve as official reporter, and the published proceedings of this Fifth Interim Meeting will be issued to all Delegates/Alternates and Branch Presidents/Secretaries well in advance of the Cincinnati Annual Meeting. Highlights of the assembly will be carried in PLATING's February issue.

PROGRAM
FIFTH INTERIM MEETING

MAROTT HOTEL,
INDIANAPOLIS, INDIANA

FRIDAY, JANUARY 10
(9 A.M. Start)
Meeting, Executive Board

FRIDAY, JANUARY 10
(Evening)
Indianapolis Branch Meeting
Attendance by National Officers and Branch Delegates/ Alternates Invited.

SATURDAY, JANUARY 11
(10 A.M. Start)
Interim Meeting
Luncheon
Interim Meeting
Adjournment
Cocktail Party

SUNDAY, JANUARY 12
(9 A.M. Start)
Meeting, Executive Board

AGENDA
FIFTH INTERIM MEETING
AES SUPREME SOCIETY

HOTEL MAROTT, INDIANAPOLIS
JANUARY 11, 1958

1. **Roll Call**
2. **Welcome by the Indianapolis Branch**
3. **Welcome by the National President**
4. **Opening of the Session as an Interim Meeting**
   Purpose of the meeting as a sounding board on matters for subsequent consideration and action by the Supreme Society at its Annual Meeting in Cincinnati in May, 1958.
5. **Reports:**
   Financial by President
   Educational by First Vice President
   Membership by Second Vice President
   Constitutional/Bylaw Amendments by Third Vice President
   AES Scientific Achievement Award by Past President
   Headquarters and Publishing by Executive Secretary
   Cincinnati Convention by Branch General Chairman
6. **Comments and questions from the Floor:**
   Educational aspects of the Society
   Educational Program
   Organic Finishing
   Finishing Expositions
   Plating courses
   Any other
7. **Preliminary report of the Structure of the Society Committee and discussion thereof.**
8. **New business brought for discussion by Delegates, including announcement of candidacies for Third Vice Presidency.**
9. **Discussion of Interim Budget (April 1 through June 30, 1958) required by transition to the Society's new fiscal year (July 1, 1958–June 30, 1959), and matter of Branch transition as to per capita taxes.**
10. **Adjournment.**

NEW! NEW! NEW! NEW! NEW! . . .

Fulflo Filters FOR ELECTROPLATING . . .
STOP COSTLY REJECTS WITH Fulflo Filters
FULFLO FILTERS FOR NEW STEPPED-UP TANK-TURNOVER
Fulflo Filters
OFFER A NEW CONCEPT OF ELECTROPLATING FILTRATION!
HONEYCOMB FILTER TUBES

YOUR GUIDE TO

MICRO-CLARITY

OF PLATING SOLUTIONS

Now . . . in one fact-filled folder . . . you have a complete description of Fulflo Filters for micro-clarity of plating solutions.

You'll learn how to get flawless plating with minimum rejects. You'll discover how Fulflo Filters enable you to get complete tank turn-over up to three times per hour. Impurities are removed as fast as they are formed or introduced. Agitation is automatically increased.

You'll see how the exclusive Honeycomb Filter Tubes provide true depth filtration, with minimum pressure drop; how their wide range of controlled densities enables you to achieve any degree of continuous micro-clarity.

You'll find rubber-lined or stainless steel containers for high *p*H solutions; plain steel for cyanide solutions. And you'll find models using 1 to 142 tubes. (One 10-inch tube filters 100 gallons per hour, lasts up to eight weeks.)

Send for your free booklet — now.

COMMERCIAL FILTERS CORPORATION
Dept. PL
2 Main Street
Melrose, Massachusetts

Please send me your free booklet on Fulflo Filters.

*Name*_____

*Title*_____

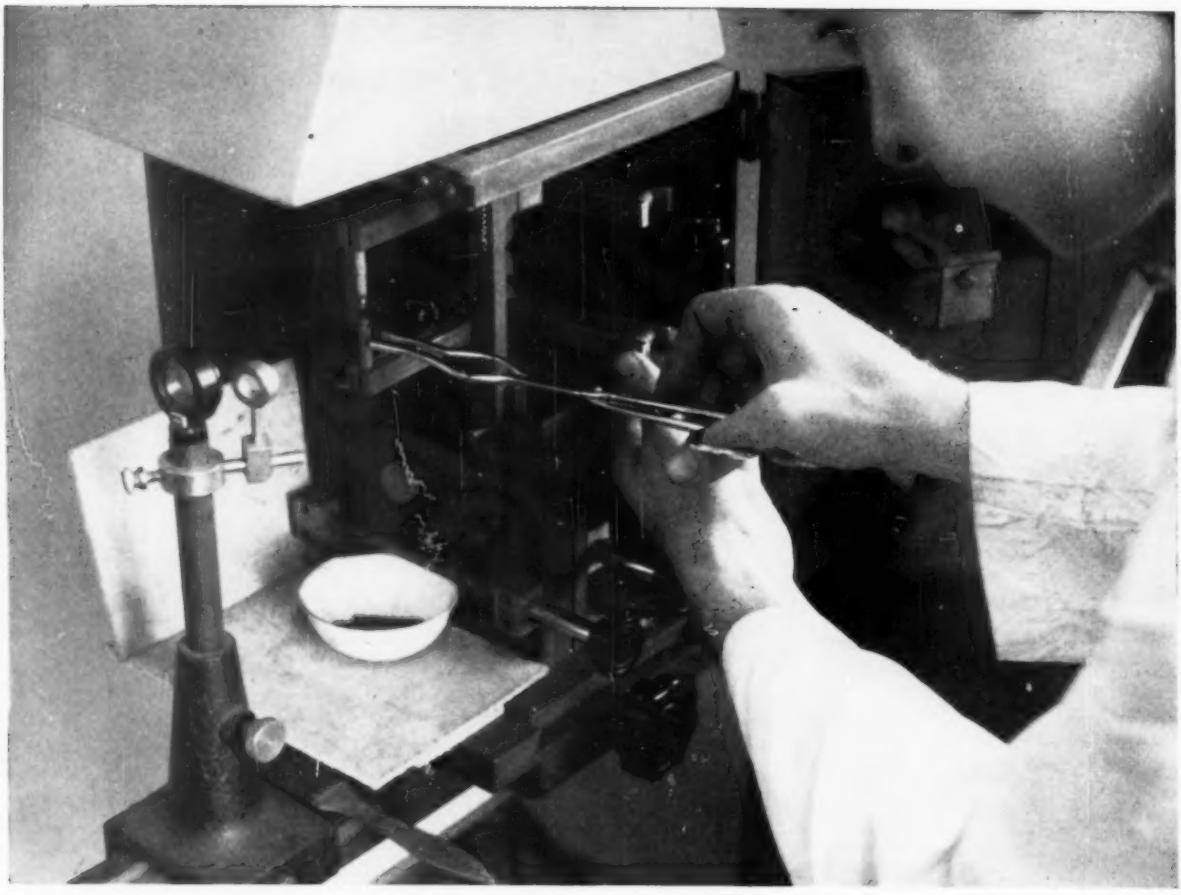
*Company*_____

*Street & No.*_____

*City & State*_____

COMMERCIAL FILTERS CORPORATION
MELROSE 76, MASSACHUSETTS
PLANTS IN MELROSE, MASSACHUSETTS AND LEBANON, INDIANA

MICRO-CLARITY AT MINIMUM COST



"We put a part of our company in every product"

"I guess you'd call our company a family business. My brothers and I have worked here almost as long as we can remember . . . and our Dad before us.

"We're not a big company as big companies go, but a few years ago we set out to make our Quality Control Lab one of the finest in the industry. We staffed it with men who are highly regarded and spent thousands upon thousands on test equipment . . . including the finest Spectrographic Instrument available. It took a lot of doing — and plenty of dollars, but it was worth it. We've grown steadily and it sure is a nice feeling to know that many of our regular customers include the finest platers in the country."

Al Kerzner, *President*

If you are a user of Copper, Nickel or Zinc Anodes, and if quality (at a competitive price) is an important factor to you, contact us! We manufacture them in a variety of sizes and shapes, and we can make them to your specifications.

NEW JERSEY METALS COMPANY

722 Rockefeller St., Elizabeth 2, N. J.

Serving Industry from Coast to Coast — since 1920

ELizabeth 4-6336

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 119.

B & A SALES REPORT NO. _____

[redacted] PLATING

Name Business

[redacted]

Home Office Address

SAME

Plant Locations Covered by this Report

SAME [redacted] PARTN

Address of Individual Interviewed Position

Plant Location (if More than One)	Annual Consumption Year	N.T.	Deliveries	Price and F. O. B. Point

Joe-
These advantages of B&A Lead-Tin Fluoborate are very important for plating electronic components.
Lets point them out in an ad.
CPB

Mr. [redacted] said that B&A's Lead-Tin Fluoborate bath is far superior for electronic use to other baths (such as Zinc-Tin hot cyanide).

Reasons: 1. Lead-Tin Fluoborate bath causes no undesirable fumes.

2. Parts plated in Lead-Tin Fluoborate baths have good shelf life. They have good solderability after storage.

FCH
CPB

Write today for complete technical information on the use of Lead-Tin Fluoborate for plating of electronic equipment. Ask for B&A Bulletin TG-36431.

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Fine Chemicals
GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
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Offices: Albany • Atlanta • Baltimore • Birmingham • Boston • Bridgeport • Buffalo • Charlotte • Chicago • Cleveland • Denver • Detroit • Houston • Jacksonville • Kalamazoo • Los Angeles • Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh • Portland (Ore.) • Providence • St. Louis • San Francisco • Seattle • Kennewick, Vancouver and Yakima (Wash.) In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

PROMAT YOUR BEST SOURCE

OF FINE CHEMICALS AND PROCESSES FOR THE METAL FINISHING *INDUSTRY*

For almost twenty years PROMAT has been supplying the metal finishing industry with the finest in chemical products and processes relating to the finishing treatment of metals.

PROMAT manufactures an unexcelled line of ZINC BRIGHTENERS, CADMIUM BRIGHTENERS, ELECTROPOLISHES, ANTI-FOAM AGENTS, DOCTOR'S SOLUTION, CLEANERS, RUSTPROOFERS, and CHROMATES.

PROMAT'S achievements in CHROMATE PROCESSING are well known and include a variety of applications such as single or double dip processes, brighteners, and O.D. colors available for ZINC, CADMIUM, and ALUMINUM.

TECHNICAL ASSISTANCE

is yours for the asking from PROMAT'S service department where highly skilled technicians stand ready to serve you in the solution of any metal finishing problem you may have.

SEND FOR

To obtain technical bulletins relating to any of PROMAT'S fine line of chemicals, or to receive PROMAT'S monthly publication "Progress," write to

PROMAT DIVISION
POOR & COMPANY
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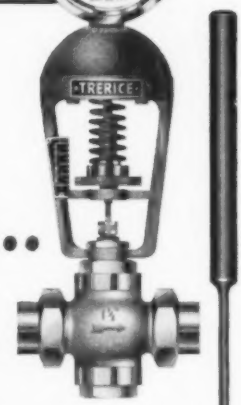

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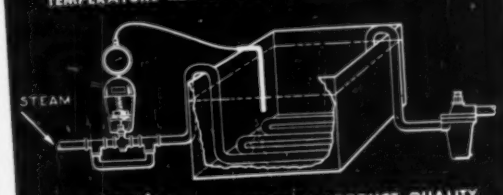

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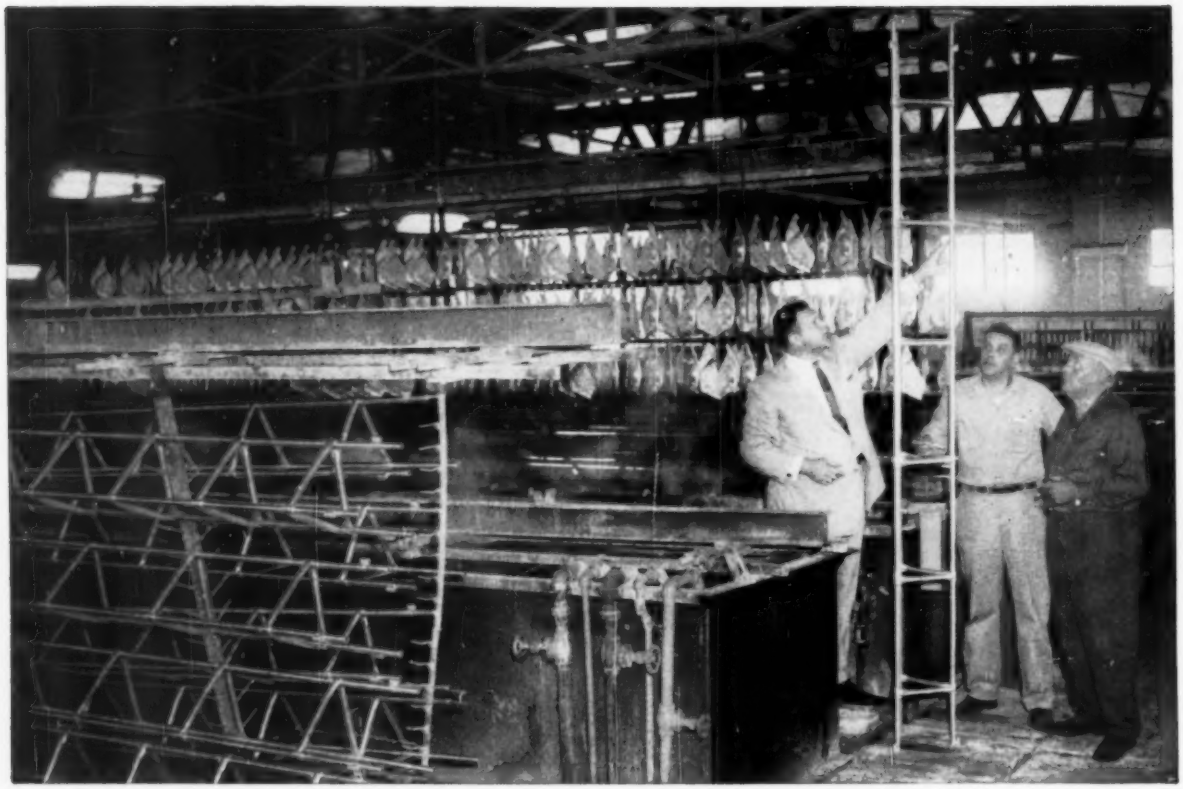

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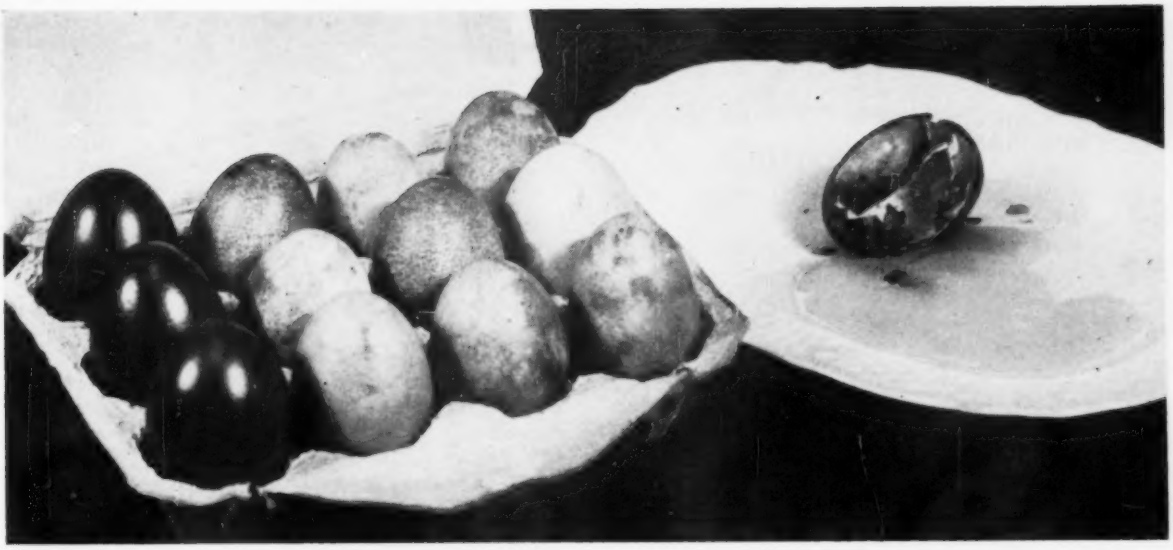

Fig. 1—This carton of raw eggs was coated with blue lacquer as indicated by the three left-hand eggs. The remainder, including the one broken in the dish on the right, were barrel finished in No. 5 Perfecut aluminum oxide chips with No. 615 abrasive compound at 10 rpm with medium water level for 35 min. The egg on the dish was broken purposely, after finishing, to show that it had been processed in the raw state.

HOW TO BARREL FINISH EGGS

by **WILLIAM BIEBEL***

THE RAW EGGS in Fig. 1 were coated with blue lacquer and then barrel finished in aluminum oxide chips and abrasive compound long enough to abrade the lacquer from all except the pores of the shell. There is probably no practical reason for barrel finishing eggs, but the ability to do so indicates that the process involved has come a long way from the day when tumbling barrels were used primarily in foundries to break fins from castings. At present, many parts as delicate or even more delicate than raw eggs are being barrel finished. Many more parts can be when the full potentialities of this method are realized.

How is it possible to barrel finish eggs or equally delicate parts with the same basic tools used in the process known as rattling, rolling, tumbling, tubbing, etc?

First, there are differences in equipment. The horizontal axis barrel is now the most widely used type of machine, but even this is not new. This type of machine has been used for more than two generations, but many important refinements have been made on this type of equipment. These include variable speed, neoprene or plastisol lining of the drum, and various improvements in operational speed and convenience. There have been important improvements in media, starting with the man-made aluminum oxide chips and progressing to the recently developed fabricated abrasive shapes which make possible the processing of parts that could not be done economically in the random shaped chips. Manufacturers of barrel finishing compounds have made very important contributions to the advancement of the process through constant improvement of this necessary tool of the trade.

However, most of the credit for the rapid strides of barrel finishing should go to those individuals who, through ingenuity, resourcefulness and many, many hours of experimental research have developed and mastered the newer techniques.

With all due respect to those who, because of peculiarities of their particular problems have gone beyond the following statement, the newer technique involves learning how to use and control the following six variables:

1. Size of media.
2. Speed of the barrel.
3. Mass height.
4. Water level.
5. Ratio of work to media.
6. Selection and use of compound.

The optimum results of barrel finishing cannot be obtained

* Vice President and Secretary, Esbec Barrel Finishing Corporation, Byram, Connecticut.

without learning to vary and control all of the above factors. The incorrect choice of any of these can result in unsatisfactory work and unnecessarily long time cycles. As parts to be processed vary in size, shape, material, size of holes, projections, slots, recesses, dimension limits and the work to be done on the part itself, there can be no one combination of these variables that will produce the best results on all parts.

The result is an almost limitless number of possible combinations. What complicates the problem is the fact that possibly only one combination will produce the required result.

The finishing man, therefore, must have sufficient knowledge of the results of the variables to intelligently choose the most logical combination to fit the particular part and the work to be done on it. Even the most expert, however, cannot always determine the best combination the first time. Sometimes several different tests must be run before the optimum is developed.

He must, therefore, examine each of the following variables in the light of the part involved and the requirements of the job.

MEDIA SIZE

Regardless of the type of media used, the following principle holds true: The larger the media particle size, the faster it does its work. This is due to the pressure available at its point of contact and can be illustrated as follows: If your hand is trapped between the ground and a 100-lb stone, there probably will be enough pressure at a particular point to cause pain. However, if your hand were between the ground and a 100-lb pile of sand, the pressure would be distributed over a larger area and cause no pain. If, in the instance of the stone, you were to snatch your hand away, the skin would be cut or lacerated; but snatching your hand from under the sand would cause no serious skin injury, although this continual action would result in some skin removal. As in the above illustration, the principle of pressure and relative speed applies to the media used in barrel finishing.

The eggs in Fig. 1 would not survive barrel finishing in a large size of media. The media size used on any individual part must be small enough to cause no damage; but if the shortest possible time cycle is desired, the media should be as large as possible. If the optimum size media will cause wedging or make separation after processing impossible, then a mixture of smaller and larger sizes can be used to distribute the pressure of the large size and to simultaneously increase the work done by the small size. The selection of the optimum chip size can only be determined by experimentation, experience, or comparison to results obtained on pieces of similar shape, material and dimensions. (Fig. 2)

Fig. 2—Two aluminum castings typical of parts which can now be barrel finished more successfully and economically as a result of the development of fabricated abrasive media of controlled shape and size.

BARREL SPEED

The proper rotation speed of the barrel is important to obtain the fastest cut without damage. The eggs in Fig. 1 were processed in a barrel at 10 rpm. If everything else were equal, and the barrel were rotated at 15 rpm or over, the impact of the eggs themselves upon each other or against the walls of the barrel would cause them to break. The same holds for any delicate part which is easily damaged by bending, nicking or impinging. More damage is done by parts striking against each other than by media striking the parts. A safe rule to use on delicate parts is to rotate the drum as slowly as possible. If the part shows adverse effects in one-half hour, either the speed is still too fast or one of the other variables must be changed. Of course, if there is no damage, the other variables can be considered safe and the barrel speeded up every half hour with inspection of the parts at each interval until the maximum speed is reached. This method, while time consuming, pays off on subsequent runs of the part.

WATER LEVEL

Water level is an important variable which often is overlooked, but which should be controlled to obtain more consistent, faster or more satisfactory results. Less water is needed for barrel finishing than many operators realize. In the horizontal barrel, the tendency is to use an even water level or higher because it is not until he can see the water that the operator knows how much he has in the drum. This, then, is used as a yardstick. We do not intend to say that such levels should never be used because they do have a definite purpose on some operations, but the habit of using even or high water levels solely for convenience in measuring not only wastes compounds, but can often slow down or cause less than satisfactory results.

The ideal situation would be to use water meters. If this cannot be done, water can be measured in a pail or container and dumped into the barrel, for all operations except rinsing. A faster system is to experimentally time the volume of water flow from the hose, and then it is an easy matter to control the volume by watching the second hand on a clock as the water is added.

One of the ways in which water levels are used as a controlled variable is based upon the fact that water makes the chips buoyant. We all know from experience at the beach that the apparent weight of a stone is much less under water than above the water. The same is true in the tumbling barrel. During cutting or grinding operations, a low water level will provide a faster cut than a high water level due to maximum pressure of the media. If this maximum pressure results in damage, and if it is still desirable to use this size chip for other reasons, a higher water level can be used to make the media more buoyant and to provide a cushioning pool of water at the bottom of the slide. There are no common definitions of water level in the industry at present, but the following is an example of a system used by many barrel finishing specialists. Such definitions must be expressed in relation to barrel capacity and load height, rather than number of gallons of water, in order to make them applicable to different barrel sizes.

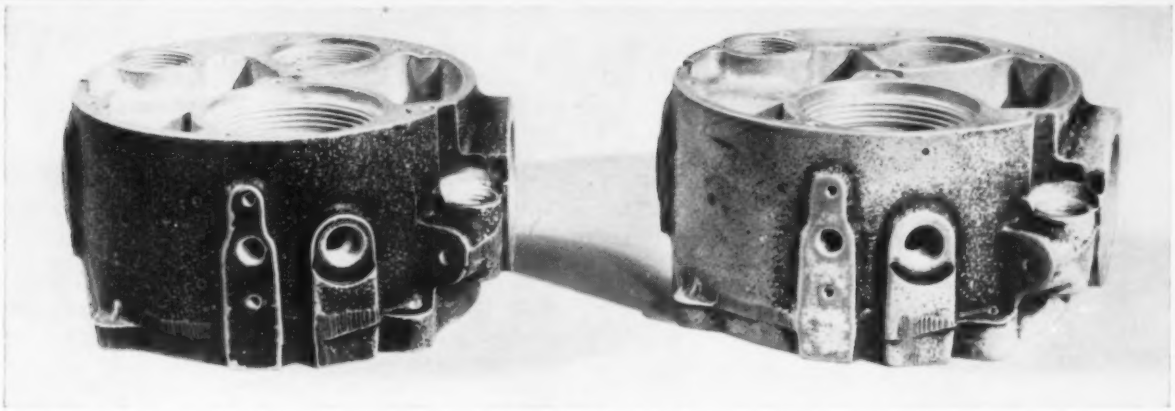

Fig. 3—This photograph shows two parts which were barrel finished in aluminum oxide chips under identical conditions except that a cleaner or detergent type compound was used with the part on the left, and an abrasive compound with the part on the right. The degree of edge break is practically identical (although it may appear to be more on the left piece because of contrast between light and dark areas). This is a visual demonstration that, if surface refinement is required, an abrasive compound should be added to the abrasive media. Conversely, if edge break is desired without surface refinement or accompanying dimension reduction, a detergent type cleaner should be used.

1. Low water—2 in. above bottom of barrel.
2. Medium water—2 in. below level mass height.
3. Level water—even with level mass.
4. High water—2 in. above level mass height.

The number of gallons is then determined experimentally for the different barrel sizes in the department.

The exact definitions are not as important as it is that a system be used which everyone connected with a barrel finishing operation understands. Only in such a way can water levels be controlled for consistent results.

MASS HEIGHT

The height of the mass (or load) is probably the most critical of the variables, both in regard to speed of results and prevention of damage to the parts being processed. While experts do not agree upon the reasons, it is generally accepted that a 50 per cent mass height produces results faster than a 60 per cent level, and a 60 per cent level, faster results than a 70 per cent level, etc. Also, it has been proven that, while a 70 per cent level is slower than a 50 per cent level, delicate parts are treated more gently and safely in the 70 per cent load.

Even though the time *per load* is longer at the 70 per cent height, total production may be just as fast as with a 50 per cent level because more parts are processed per load. Mass heights of less than 50 per cent are being used in some instances, but this is not common because of the smaller potential payload for a given size drum. Usually, a part being run for the first time is loaded at a 60 per cent level and mass height changed on subsequent runs if a reason for change is indicated.

PROPORTIONS OF MEDIA TO WORK

This is difficult to establish in advance of experimental runs. The most popular rule of thumb which states that one part or parts by volume to three parts of media by volume is very common and is workable on all but unsymmetrical, large, heavy or delicate parts. Actually, it is nearly impossible to establish a rule for part-to-media ratio when there are no clear definitions of unsymmetrical, large, heavy and delicate parts. However, one rule can be used to advantage and that is to make certain that, on the first experimental run with a new part, the ratio of parts to media is low enough to be safe. In this way, all other variables can be checked out for damage to the part which is always the thing to be avoided. If the part involved is very questionable or expensive, it is even better to run one or two to determine whether the part can be barrel finished satisfactorily without damage by the media. For example, the eggs in Fig. 1 were run at a ratio of 1 to 15. Undoubtedly, this ratio could be changed; but aside from the fact that the most efficient ratio for finishing eggs is pointless, such a ratio established the important fact that the part in question can be processed.

SELECTION OF COMPOUND

While manufacturers of barrel finishing compounds have pretty well educated the user that compound is important and necessary for proper barrel finishing, some confusion as to "when to use what" still exists because of the variety of brand names and numbers on the market. There are three main types of compounds: cleaners, abrasive and burnishing compounds.

The cleaners or detergent type compounds are used to remove oil from parts and to clean the media and interior surfaces of the barrel and to help to retain the natural color of the metal. When used with aluminum oxide chips or other cutting media, they serve an even more important function of keeping the chips open and free cutting as does the coolant on a grinding wheel. If the problem is to deburr or to form a radius using aluminum oxide chips, a cleaner should be used instead of an abrasive compound. The cleaner will keep the chips open and fast cutting and is less costly because a smaller quantity is required.

Another reason for using a cleaner for the problem stated is that the dimensions of the part will be affected only very

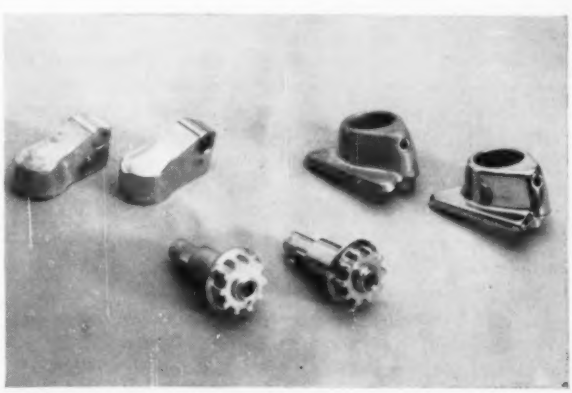

Fig. 4—Zinc die cast parts can be successfully barrel finished only by careful control of the variables involved in the process.

TABLE I

Compounds appear in order of preference for normal conditions; i.e., the first compound listed should be used first. Variation in alloys, however, may make it advisable to try the alternates shown.

METAL	REMOVING OIL OR GREASE	EDGE BREAK AND OR DEBURRING		DEBURRING AND OR SURFACE REFINEMENT		MICRO FINISHING	BURNISHING		BLEACHING & LIGHT DESCALING	HEAVY DESCALING	NEUTRALIZING
		As O. Chips	Natural Chips	Up to 8 Hrs.	Over 8 Hrs.		Chips	Steel Media			
STEEL	#1 #25	#1	#615 #680	#615 #680 #619	#610 #615	#574	#203 #210 #212 #240 #200	#212 #210 #213	#134 100-G	#102 100-G	#1
ALUMINUM	#25	#25 #213	#680 #615	#634 #680 #615	#653 #680	#574	#203 #212 #210	#213 #212 #210			
STAINLESS	#25	#25 #213	#680 #615	#680 #615 #619	#615 #610	#574	#203 #210 #212 #2408	#212 #2408 #210	#134 100-G	#102 100-G	
COPPER ALLOYS	#25	#203 #213 #25	#654 #680 #615	#654 #680 #615	#653 #680	#574	#203 #212 #2408 #210	#213 #212 #2408 #210	#134 #1000	#102 #100-G	
ZINC	#205	#205	#615 #655	#655 #615	#615 #655	#655	#205	#205			
MAGNESIUM		#680-S	#680S	#680S	#680S	#655					
SILVER	#25	#25	#574	#574	#574	#574	#203 #213 #210	#25			

slightly. (More will be added to this under abrasive compounds.)

A non-abrasive acid descaler is a special type cleaner and need only be used for removing heat treat scale. The descalers at one time were also used for bleaching or lightening the color of parts after long cutdown runs in aluminum oxide chips, but this is no longer necessary.

Abrasive compounds are used to provide cut for non-cutting media such as metallic balls or shapes and some natural chips. They are also used with aluminum oxide media where the problem is to remove stock from the dimensions of the part in order to remove tool marks or improve the rms finish. For cutting the blue lacquer from the surface of the eggs, an abrasive compound was used in conjunction with the No. 5 (3/16–¼ in.) aluminum oxide chips to speed up the result. A large variety of abrasive compounds is furnished by all major barrel finishing suppliers, not only because of the many different alloys being processed, but also because of the varying amounts of stock being removed in different applications. There can be no truly all-purpose abrasive compound with a harsh cut because of the difficulty in removing unexpended abrasive from the chips before the burnishing operation. Abrasive compound particles carried over into the burnishing operation will not permit the burnishing compound to do its proper work. A second reason is that a rough abrasive compound leaves a rough surface. Burnishing such a surface is similar to buffing a surface obtained on a 90-grit belt. Therefore, the ideal abrasive compound for a particular job must break down finer and finer through use until the cutting action is completely gone just about the same time as the desired amount of stock has been removed. Then the fine pulverized abrasive particles can be removed by rinsing, and the surface is as smooth as can be obtained with an abrasive compound in the media being used. If the part does not require a high burnished finish, a harsher, longer lasting abrasive compound may be used.

An example of the difference in results between a cleaner an an abrasive compound is shown in Fig. 3. These aluminum castings were coated with black paint and the parts processed in a similar manner except that one was run with No. 25, a cleaner, and the other with No. 615, an abrasive compound. After equivalent time cycles, the radii of both parts measured the same, but the appearance on the flat surfaces of the parts shows a big difference in the amount of paint removed from the castings. Naturally, the part with more paint removed would also have more aluminum removed and larger dimension changes.

Burnishing compounds, as their name implies, are used for developing good color and lustre on the parts being processed. They are used with all types of media, and their use is pretty well understood. By varying the proportions used in relation to the water level, different viscosities of solution and different brightening effects of the metal can be obtained. Water levels used are arbitrary and depend more upon the effect of the water level itself as a variable than the amount of the water necessary for good burnishing.

Many barrel finishing specialists use a high water level, while others get just as good results with low or medium water levels. The most important factors in good burnishing are to thoroughly rinse any other compound from the barrel before burnishing and to use the recommended amount of compound in proportion to the water used. Recent evidence indicates that, with all other factors equal, slower speeds will produce better burnishing results than will a fast speed.

The selection of the particular burnishing compound to be used is often difficult. There is not, and probably never will be, a single compound that will do the most satisfactory job on all parts for the following reasons:

The parts to be processed vary not only in the material they are made of, such as cast iron, steel, aluminum, brass, zinc, magnesium, but also in many variations of alloys within these classifications. It is impossible to use the same chemicals on magnesium that would be used on cast iron, for example. (Fig. 4)

Another obstacle is subsequent treatment of the parts after burnishing. For example, many platers will not use a soap base burnishing compound on a brass part which is going to be lacquered. Yet there are many good soap base burnishing compounds.

The best approach to selection of a burnishing compound is to work with the representatives of a reliable manufacturer of barrel finishing compounds. Another way is to follow a chart such as the one in Table I which not only lists choices of burnishing compounds, but cleaners and abrasives as well. In addition, representatives will be happy to provide working samples or run laboratory tests.

The mastery of the six variables discussed should enable anyone to obtain the best possible results in all but the very unusual cases. When these do occur, success often depends upon the imagination of the individual and results from the use of other materials and less orthodox methods which it is impossible to discuss here because of space limitations.

William Biebel was born in Bridgeport, Connecticut. Attended Oberlin College, Bridgeport Engineering Institute and the University of Bridgeport where he received a BS degree in Industrial Engineering.

He was employed by the Singer Manufacturing Company in various metal finishing capacities for 15 years, with his last assignment being Methods Engineer for polishing, buffing and barrel finishing techniques.

In 1952, he joined his present company to organize and supervise a barrel finishing job shop. In October, 1955, Bill was made Vice President and Secretary of Esbec Barrel Finishing Corporation (present capacity) with responsibilities for design and production of barrel finishing compounds and equipment.

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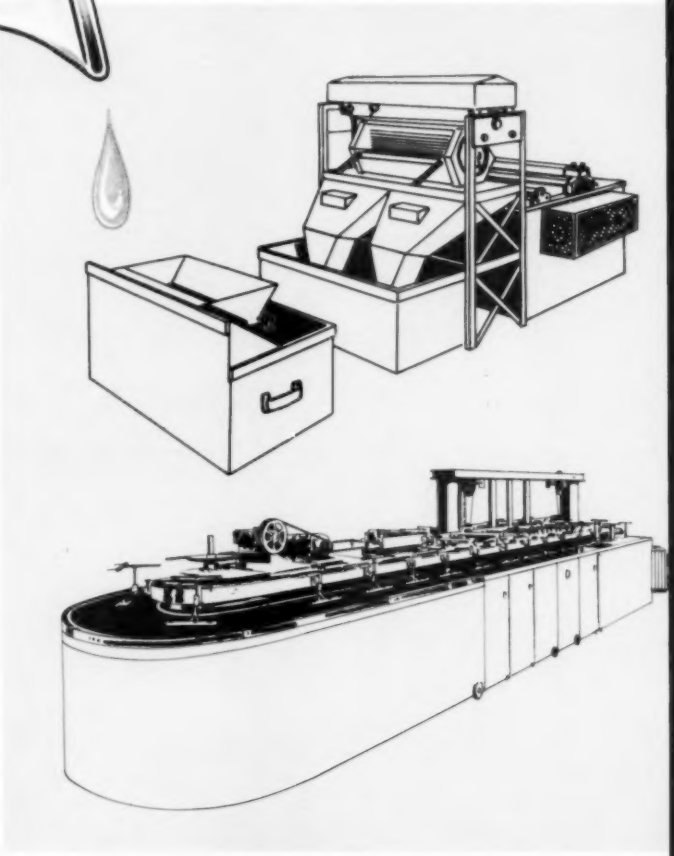

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◀ INDICATE B 101.

LIQUID vs. BAR BUFFING COMPOUND

by E. T. CANDEE*

LITTLE HAS BEEN DEVELOPED recently of a new nature in the traditional buffing bar, either from the standpoint of new material or new methods. Buffing bars are basically the same as they have been for some years and until a "breakthrough" occurs, they can be expected to remain standard. The only notable improvements have been in the availability of new materials, some of which produce better finishes, better cleaning, etc. They also make possible better utilization of the bars resulting in more pieces buffed per pound of compound.

The chief trend in 1957 has been continuous expansion of the use of liquid buffing compounds at the expense of bar buffing compound. This trend can be expected to continue through 1958. Although liquid buffing compounds have been on the market for ten years, it only has been in the last few years that formulations have been developed and know-how accumulated on actual installations to make it a full-fledged competitor of bars.

Some of the advantages of liquids over bars are:

1. Liquids lend themselves to automatic buffing and machine buffing because of infrequent operational interruption to replenish the supply of compound.
2. Danger in handling and replacing of bars of the machine in operation is eliminated. There are no broken pieces to fly around and it is not necessary for an operator to get near the machine for compound replacement.
3. Whereas in some cases it is necessary to shut an automatic machine down to replace the bars, particularly if a long time is required for the changeover, the changeover can be made with liquid so quickly that it is never necessary to shut the machine down.
4. Liquids lend themselves to many formulations which are not possible to produce in bar form. In some cases, the grease binder can be liquid at room temperature—impossible with bars. In other cases, the liquid can be made very dry for special applications.

The first large scale use of liquids for buffing occurred in the silverware industry where knives, forks and spoons were buffed on wide-roll machines. Whereas the wide-roll machines were good from a production standpoint, they were particularly dangerous in applying bar to the wheels, in fact several men have been pulled into the machine and killed. Liquids were easy to apply in this type of machine and it completely eliminated the danger to the operator. The compound could be added in the middle of a cycle if required to increase the work done on the parts. Fig. 1 shows a typical installation of a Clair machine buffing tableware.

Buffing parts of all types with liquid buffing compound requires the same basic setup of equipment, except for details to fit individual standard machines. First, there must be a supply of compound. It may be drawn directly from the drum in which the compound is shipped (Fig. 2). The compound is pumped from the drum through piping to the machine and the guns which atomize the compound onto the buff wheel. The usual pump is operated by air and it is practice to recirculate the compound to eliminate dead ends.

The other typical method is to pour (Fig. 3) the compound into pressure tanks which may vary from 2 to 30 gallons in capacity. In this case, air pressure is maintained above the compound, thereby forcing it through the piping to the gun on the buffing machine. Where small amounts of compound are used, pressure tanks are most advantageous. They are also of help where it is necessary to change compounds for different types of work being buffed. Another case where the pressure tanks are commonly used is for the coloring wheels of a machine where there is a cutting operation on the first several wheels. In this case the coloring compound is used in lesser quantities and the pressure tanks have advantages.

The liquid buffing compound is piped usually through manifolds to the machine equipped with proper shut-off valves and in some cases, pressure regulating valves. It is conveyed through rigid piping and flexible tubing to the gun itself. Fig. 4 shows a typical gun where the compound enters one port; the air both to actuate the gun and atomize the compound enters a separate port. This gun will operate for long periods of time with only minor adjustments or cleaning and is sealed tight enough so the compound can remain in the lines overnight without settling out or jamming the gun. The guns are usually held by a bracket and in most cases the air line pipe can act as the bracket. The gun must

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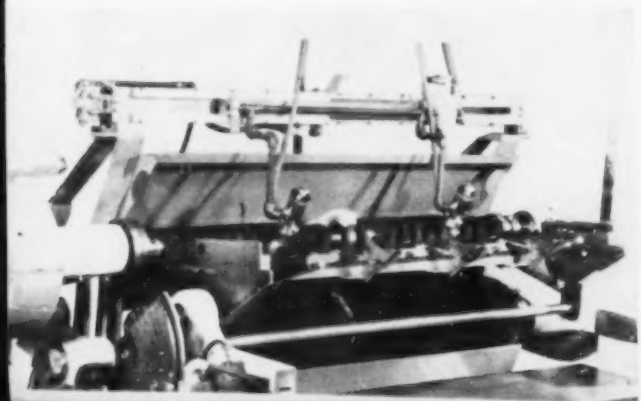


◀ Fig. 1

Fig. 2

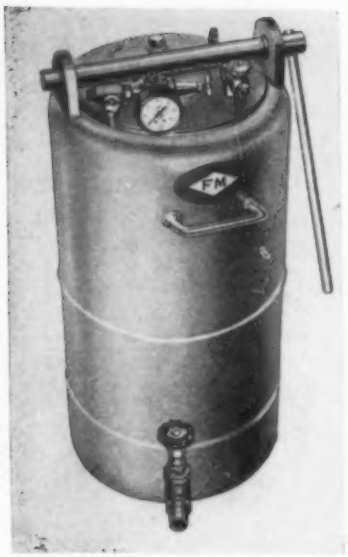


Fig. 3

be placed in the proper location with relation to the wheel. These guns will require little readjustment unless the wheels are worn several inches below their original diameter.

The other piece of equipment required is a valving arrangement to control the air which in turn controls the frequency and the duration of the application of compound. In the past, cam valves were used, but have been largely abandoned due to the excess wear on the parts. In many cases, foot valves were used, but they required an operator to remember to trip them.

The most common setup today is to use an automatic timer with a solenoid valve. The typical timer shown in Fig. 5 can be set so that the compound can be sprayed from once each second to once in two minutes, and the duration of the spray can be from ½ to 30 seconds. The usual setup calls for compound to be applied every 5 to 20 seconds and the length of an individual spray all the way from ½ to 2 seconds.

Possibly the best way to illustrate typical setups for utilization of liquid buffing compounds is to refer to the schematic drawings of typical layouts in Figs. 6 and 7.

Fig. 6 shows a schematic drawing of a straight-line buffing machine with a drum and drum pump for compound supply, using a timer with solenoid valves on each gun. The other equipment—such as the air filter, the air pressure regulators to each gun—is common and required for all installations. In some cases where there are very long fluid lines, 100 ft or over, it is desirable to use a pressure regulator in the compound

Fig. 4

line to be sure that all guns receive uniform application of compound.

Fig. 7 shows a typical schematic diagram for a rotary machine. In this case, the compound is supplied from a pressure

Fig. 5

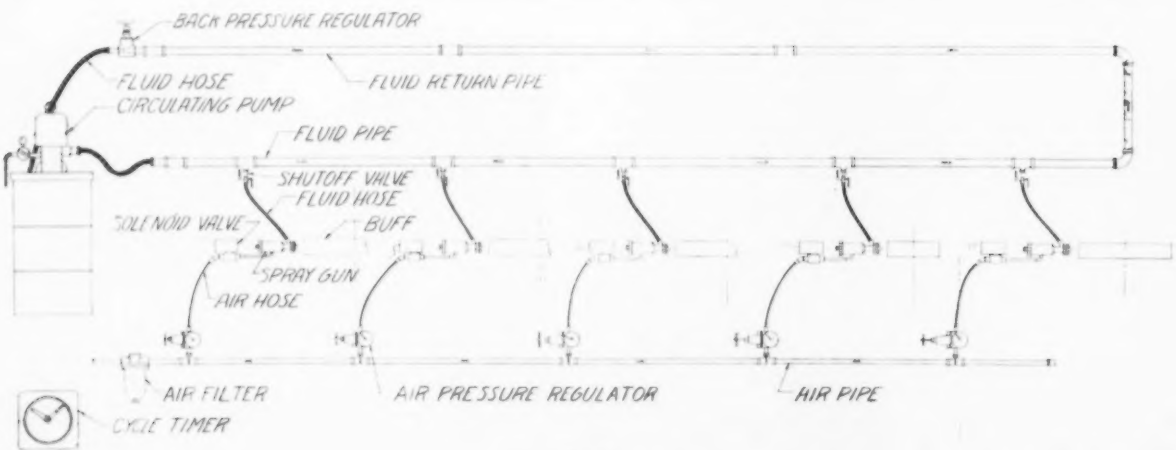


Fig. 6

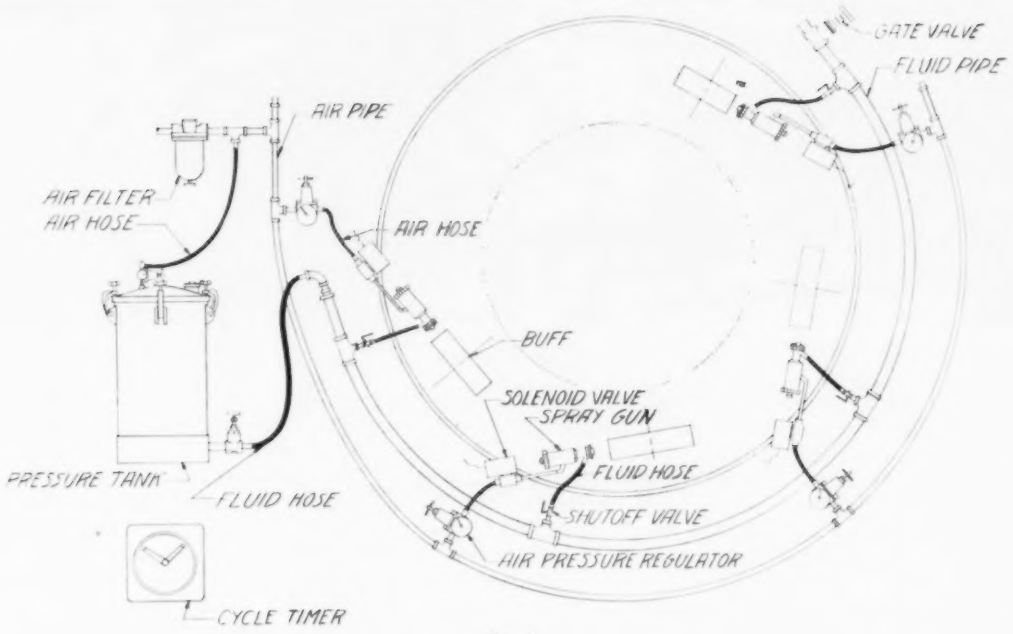


Fig. 7

tank, but the other details are very similar to the stright-line automatic. The sizes of manifolds for both air and liquid compound depend on the particular machine and should be engineered by people familiar with such equipment.

Subsequent to the application of liquid buffing compounds in the tableware industry, it was introduced into the die casting industry. Here, many failures occurred but it also met with success. As with any new process, there was the long development phase to obtain correct formulations and applications. Today, however, the formulations of liquid buffing compounds are available for every type of die casting.

In the original stages of development, it was felt that any setup between spray gun and wheel was all right as long as the compound was propelled toward the wheel. It has since been learned that the location of guns in relation to the wheel is very important. Even with modern formulations, design of the setup is all-important in doing an adequate buffing job and doing it economically. As in the design of the manifolds, the layout and positioning of the guns is best solved by people qualified to engineer this type of installation.

Today, all metals can be buffed with liquid buffing compound and even materials such as plastics are commonly buffed. Liquid compounds are available which will produce more cut than bar compound. At the other extreme, liquid compounds are available which will produce work clean enough to be wrapped and shipped as it is taken from the buffing machine.

Installations showing location of guns, wheels and work give an idea of the flexibility of the method. Figs. 8 and 9 show a setup for buffing stainless steel flatiron tops. It is noted that the gun sprays compound through the shield on the buff wheel, and the gun is set to cover a 5-in. wide buff. In this particular case, the gun is located 90° ahead of the work to give the maximum compound utilization. Fig. 9 shows the same machine as Fig. 8 equipped with a belt sanding device originally used to remove major defects from the stain-

Fig. 8

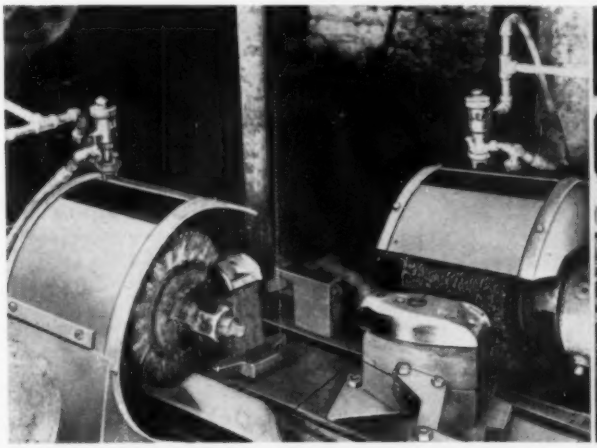
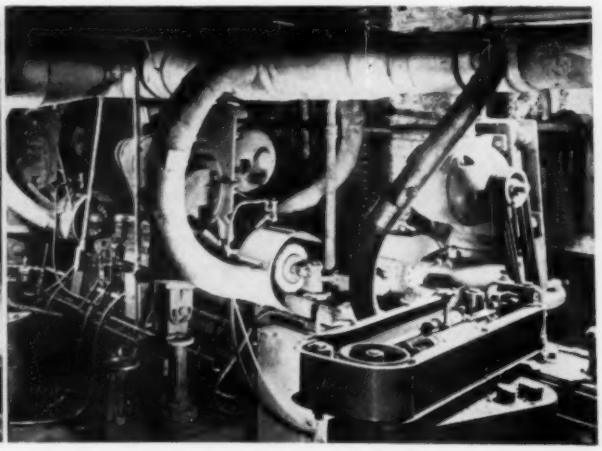


Fig. 9



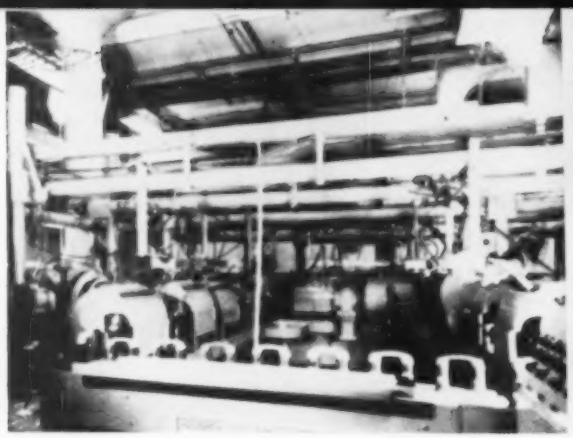


Fig. 10

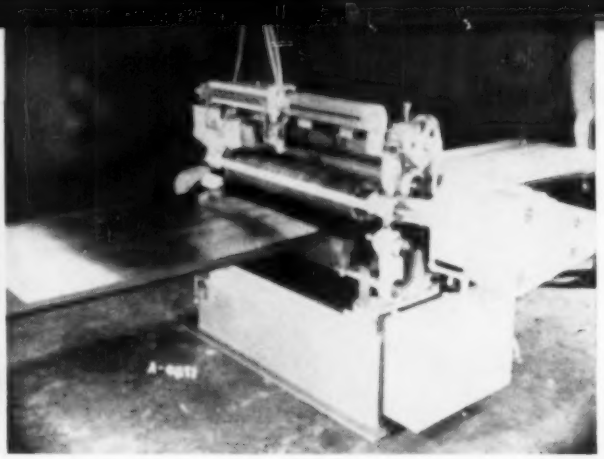


Fig. 11

less steel shells. However, it was found that by using the proper grades of liquid buffing compound, the belt operation could be eliminated and today the machine operates with two compounds which produce a bright commercial finish ready for shipping.

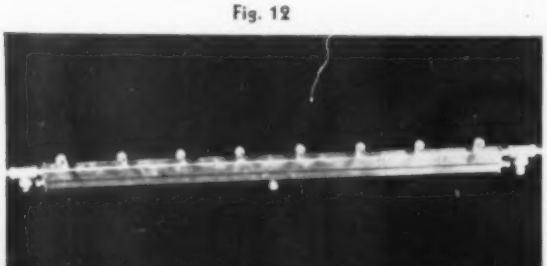
One of the newer machines which has been developed is the Harper machine which is rectangular in section and is used for many unique types of buffing. Fig. 10 shows an overall view of the machine buffing plastic telephone hand sets. This buffing machine uses buffs which are 20 in. wide and a simple gun mover has been developed to swing the gun back-and-forth to cover the full 20-in. face of the buff. With the timer operating the gun and the gun mover, it is possible to apply compound at the proper frequency and in the exact quantity to keep the load on the buff for continuous operation of buffing hand sets. The same type of machine is used for buffing all other metals of many shapes. It is ideally suited for use with liquid buffing compounds, properly selected for the work at hand.

Fig. 11 shows a Clair machine set to buff flat sheets. The table reciprocates back and forth with an oscillatory motion to prevent grooving. The continuous face buff has a compound applied with a gun and gun mover specially designed for the machine. This same machine can be set up for a multitude of small parts and is versatile for mouldings, small tools, shear blades and such shapes which lend themselves to an operation of a table. By the use of a gun mover, a single gun traverses the full width of the buff assuring uniform compound application and frequent enough application for the job in process. This gun can be operated either with a timer or with control that starts the machine in operation.

Fig. 12 shows a mani-spray* for use on wide-roll machines. In many cases wheels are used which are too wide for a single gun to cover and a multiple gun setup is both cumbersome and a maintenance problem. Also, in many cases, gun movers such as shown in the previous illustrations are not feasible due to space limitations. The mani-spray shown in Fig. 12 has compound supplied to each end and air is supplied at the center. Each of the light orifices shown sprays compound on the wheel in a uniform pattern. This type of spray is available for any width of wheel and is widely used where other devices are impractical. Due to the simplicity and lack of moving parts, it requires practically no maintenance and is ideal as a production tool.

* Developed by the Lea Manufacturing Co.

Fig. 12



Liquid buffing compounds have many advantages from a production standpoint and if properly used, can be more economical than bars. Even without the problem of nubbins, which must be remelted and reprocessed, liquid buffing compounds will often save from $\frac{1}{3}$ to $\frac{1}{2}$ of the compound cost on a particular machine. A second source of saving is in the buffs. Due to the fact that water is commonly used as a vehicle, the tendency is to keep the buffs cooler and increase the buff life. There have been cases where buff consumption has been reduced to one-eighth when used with liquid buffing compounds compared with bar compound, and it is not uncommon to achieve buff life two to three times that attained with bar.

A third major economy is that more hours of production are obtained from the machines, due to less shutdown. Ten to twenty per cent more production is not uncommon and in special cases the improvement is greater.

The fourth economy is in the ease of cleaning brought about by substitute of lower cost cleaning method and a greater permissible storage time before cleaning in the plating cycle.

When the lower initial cost of liquid buffing compound installations, made under proper engineering guidance, is added to the three major savings that have been mentioned, the liquid compounds are economically justifying themselves—to say nothing of the safety of operation and quality of output.

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TAKING THE GUESSWORK OUT OF GRINDING AND POLISHING WITH ABRASIVE BELTS

by WARREN K. SEWARD*

SUCCESSFUL APPLICATIONS IN GRINDING and polishing with coated abrasive belts have long been attributed to the art of applying various combinations of conditions and sequences for a particular set-up without any apparent established method. From the layman's point of view, this might appear to be true. However, there are very definite principles which are essentially fundamental in nature and which apply to most grinding and polishing operations. This is recognized widely as being true for many machining operations other than those performed with coated abrasives. However, this is not only also true in using coated abrasive belts but many operating methods and techniques are also pertinent to improve upon the basic fundamentals. Most modern abrasive belt set-ups have a number of things in common. These include a contact wheel, one or more idlers and the abrasive belt itself.

THE BACKSTAND IDLER

The idler can play a very important part in the success of the operation as well as having an effect upon the attitude of the operator. When a relatively heavy backstand idler is used in conjunction with a narrow and/or soft contact wheel, it may prove to be difficult to bring the belt up to operating speed without resorting to jogging the motor on and off to raise the spindle speed gradually. The heavy idler has a large mass and a large moment of inertia which must be overcome by the abrasive belt in accelerating from zero to operating speed. The contact wheel is usually the driving wheel and, where the wheel is soft and/or narrow, the inertia of the idler and the tension on the tight side of the abrasive belt may cause the contact wheel to deform. Under such conditions, the abrasive belt may run completely off both pulleys unless the motor is jogged on and off to bring the unit up to speed gradually. Idlers can be too massive.

TRACKING DIFFICULTIES

Practically all idlers are equipped with a means of tracking as well as of applying tension to the abrasive belt. Tracking is accomplished in one of two ways, but in either case the most important factor to obtain successful tracking is to have the idler pulley cantilevered or slightly off-center, so that the abrasive belt tension nullifies any looseness or play in the idler assembly. Any play in the idler which is not compensated for by belt tension may cause the idler to vibrate so that the belt is continually walking from one side of the contact wheel to the other and will not track properly.

Another common source of tracking difficulty may be found in the contact wheel. A contact wheel in the medium to soft range of hardness which is operated at a speed higher than that at which it was dressed will usually cause the abrasive belt to over-hang one edge of the contact wheel and make it difficult, if not impossible, to properly center the belt on the wheel. This happens because the edges of the contact wheel, which are unsupported on one side tend to "throw out" or "balloon" due to centrifugal force, thus making the center of the wheel face lower than the edges and causing tracking difficulties. Dressing the contact wheel at operating speeds will correct this condition.

BELT SPEEDS

On the next page is a table of speed recommendations for abrasive belts when used for grinding and polishing various

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TABLE I
Starting Recommendations
Roughing or Cutting Down

	Steel and Stainless Steel	Aluminum (All Types)	Tough Bronzes	Brass, Copper and Soft Bronzes	Cast Iron	Die Castings
Grain Type	ALO	SIC (Light Pressure) ALO (Heavy Pressure)	ALO	SIC	SIC (Light Pressure) ALO (Heavy Pressure)	
Grit Range	24–60	24–60	24–60	24–60	24–50	
Belt Speed (SFPM)	4000–6000	5500–7000	4000–6000	5000–6500	4500–6500	
Contact Wheel and Density	Serrated Rubber—70–90 durometer Type 81 or 86–70/20–70D*/60	Serrated Rubber—70–90 durometer Type 81 or 86–70/20–70D*/60	Serrated Rubber—70–90 durometer Type 81 or 86–70/20–70D*/60	Serrated Rubber—70–90 durometer Type 81 or 86–70/20–70D/60*	Serrated Rubber—70–90 durometer Type 81 or 86–70/20–70D/60*	
Intermediate Operations						
Grain Type	ALO *(SIC for Stainless)	ALO (Heavy Pressure) SIC (Light Pressure for brighter polished surface)	ALO	SIC	SIC	ALO (SIC for brighter polished surface
Grit Range	80–180	80–180	80–180	80–180	60–120	80–180
Belt Speed (SFPM)	4000–6000	5500–7000	4000–6000	5000–6500	4500–6500	5500–7000
Contact Wheel and Density	Rubber—plain or serrated. 20–90 durometer Type 81 or 86 50/20–90/20,* Compressed canvas, Buff type—solid or sectional	Rubber—plain or serrated. 20–90 durometer Type 81 or 86 50/20–90/20,* Compressed canvas, Buff type—solid or sectional	Rubber—plain or serrated. 20–90 durometer Type 81 or 86 50/20–90/20,* Compressed canvas, Buff type—solid or sectional	Rubber—plain or serrated. 20–90 durometer Type 81 or 86 50/20–90/20,* Compressed canvas, Buff type—solid or sectional	Serrated rubber—20–90 durometer, Type 81 50/20–90/20*	Rubber—plain or serrated. 20–70 durometer Type 81 or 86 50/20–70/20* Compressed canvas, Buff type—solid or sectional
Finishing or Oiling Out Operations						
Grain Type	ALO **(SIC for Stainless)	ALO (SIC for brighter polished surface)	ALO	SIC	SIC	ALO (SIC for brighter polished surface)
Grit Size	180–500	180–500	180–500	180–320	150–240	180–320
Belt Speed (SFPM)	4500–6500	5500–7500	4500–6500	5500–7000	4500–6500	6000–8000
Contact Wheel and Density	Rubber—plain or serrated. 20–50 durometer Type 81 or 86 50/20,* Compressed canvas, Buff type—solid or sectional	Rubber—plain or serrated. 20–50 durometer Type 81 or 86 50/20,* Compressed canvas, Buff type—solid or sectional	Rubber—plain or serrated. 20–50 durometer Type 81 or 86 50/20,* Compressed canvas, Buff type—solid or sectional	Rubber—plain or serrated. 20–50 durometer Type 81 or 86 50/20,* Compressed canvas, Buff type—solid or sectional	Serrated rubber 20–50 durometer Type 81 50/20*	Rubber—plain or serrated. 20–50 durometer Type 81 or 86 50/20,* Compressed canvas, Buff type—solid or sectional

* See Figure 2.
** For special finishes on some stainless per industry standards.

representative types of materials: Belt speeds shown in Table I have been arrived at by experimenting both in the laboratory and in the field under various conditions. The results obtained follow a pattern based on the physical characteristics of the material being ground and polished. In general, the harder and tougher the material being ground, the lower the belt speed should be in the range for that basic type of material. This is reasonable, since hard materials require greater pressure to obtain penetration of the abrasive grain, and because of this the speed should be reduced for greater efficiency, to give the tool a longer period of time to remove chips from the hard material.

CONTACT WHEELS

Rough running contact wheels are a very common source of difficulty in a belt set-up. There may be other underlying causes or conditions which either contribute to or aggravate the condition, but it is basically one of having the contact wheel run true on the spindle under operating conditions.

Following are some of the conditions which may be found in the set-up which will substantially detract from the results obtained, depending upon the degree of wear or other undesirable conditions found in the set-up:

1. An undersized or worn spindle on which the contact wheel is mounted.
2. A bent spindle.
3. Worn spindle bearings.
4. An out-of-balance contact wheel. The harder the wheel, the more vital balance is.

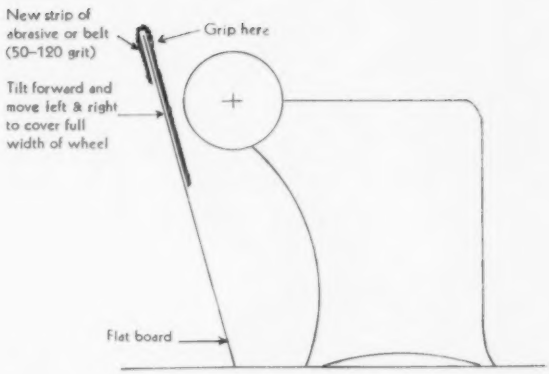

New strip of abrasive or belt (50–120 grit)
Grip here
Tilt forward and move left & right to cover full width of wheel
Flat board

Fig. 1—Dressing a contact wheel on a lathe.

5. Idler wheel or pulley which is badly out-of-round or out-of-balance.
6. Idler wheel bearings in need of replacement.
7. Idler not securely mounted on base.
8. Accumulation of grinding swarf in recess of the contact wheel and/or idler pulley.

Careful investigation of some of these conditions has shown in some cases that abrasive efficiency and production obtainable from the belt can be reduced to as little as 20 to 25 per cent of the abrasive efficiency of the belt under the same circumstances, when over-all machine and contact wheel conditions are good.

TABLE II

CONTACT WHEEL SELECTOR

Suggested Changes

Result Obtained	Softer Density	Harder Density	Narrower Lands (Wider Grooves)	Wider Lands (Narrower Grooves)	Higher Speed	Lower Speed	Change Lubricant	Deeper Grooves	True Wheel	Use Coarser Grit	Use Finer Grit	Type 81 or 86 Wheel	Check Machine Condition
Belt Glazed...		X	X			X	X						
Belt Loaded..	X		X				X	X					
Too slow cutting.....		X	X			X	X			X			
Finish too coarse.....				X	X		X				X	X	X
Burning.....		X	X			X	X			X			
Too hard for contour....	X		X			X		X					
Chatter.....	X		X					X	X			X	X
Shedding grain.....		X		X		X	X		X			X	
Dubs edges...		X											

NOTE: All of the suggested changes checked for a given condition may not be necessary, and some may not be desirable under some circumstances, to improve the results obtained.

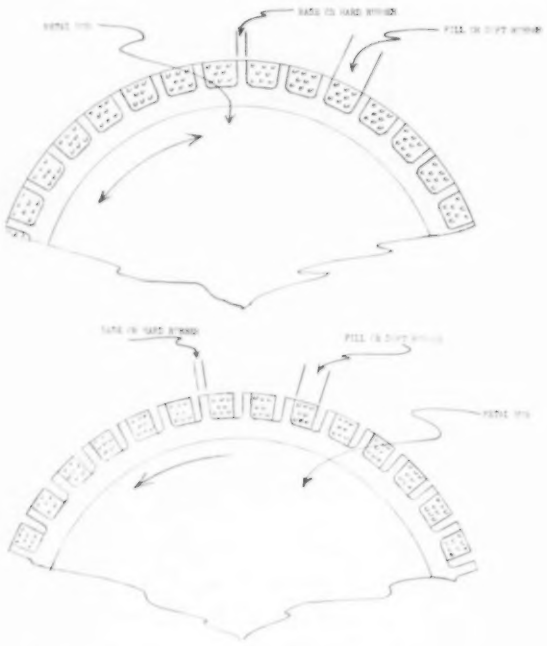


Fig. 2—The upper schematic drawing is of Type 86 contact wheel and the lower is Type 81.

The hardness of these wheels is designated by two numbers separated by a slant line. The number above the slant line is the hard or base rubber. The number below the slant line is the soft or fill rubber.

These dual durometer wheels and rolls are made in a range of hardnesses for use on various types of work:

50/20, 60/20, 70/20, 80/20, 90/20, all on the Shore "A" scale of rubber hardness.

40D/60, 50D/60, 60D/60, 70D/60. The base rubber is on the Shore "D" scale of rubber hardness and the fill is "A" scale. 70D is in the range of bowling ball hardness.

Smooth face wheels in dual durometer are designated as Type 86 wheel and rolls. Dual durometer wheels having a narrow slot cut in the soft or fill rubber are designated as Type 81 wheels and rolls.

MOUNTING THE CONTACT WHEEL ON WORN SPINDLES

A fairly common fault found in equipment which has been in use for a long time is spindles which are undersized. When a contact wheel having an arbor hole which is within tolerance is mounted on an undersized spindle, it immediately creates an out-of-round as well as out-of-balance condition. Following is a procedure which is recommended for mounting all contact wheels on such spindles which will minimize adverse effects of an out-of-round and out-of-balance wheel:

1. Make a mark on the shoulder of the machine spindle.
2. Turn this mark to the top position.
3. Make a similar mark on the contact wheel hub on any surface except the hub face where it bears against the spindle shoulder.
4. Line up the mark on the contact wheel hub with the mark on the spindle shoulder.
5. Lock the spindle nut.
6. Dress or true the contact wheel.

Following this procedure when each new contact wheel is mounted on such a spindle will insure that the wheel will run true, with a minimum of hammering action or chatter. It is true that the wheel, when mounted and dressed in this fashion, will be slightly out-of-balance. However, this slight out-of-balance condition is, in most cases, of substantially less significance than is a relatively small amount of eccentricity or out-of-roundness. When two or more contact wheels are used interchangeably on the same spindle, it is simply a matter then of turning the machine spindle so that the mark is on top and lining up this mark with the mark on the contact wheel to insure true running wheels without having to dress the wheel each time it is mounted on the spindle.

TRUING AND DRESSING CONTACT WHEELS AND ROLLS

A new piece of coated abrasive, either aluminum oxide or silicon carbide, in the grit range of 50 to 120 grit will, in most cases, produce a satisfactory medium for truing and dressing most contact wheels. (See Fig. 1)

Aggressiveness is a term often applied to contact wheels, but its meaning is somewhat different from the strict sense of the word as found in the dictionary. As applied to contact wheels aggressiveness simply means the ability of the contact wheel to make the belt cut. Aggressiveness of a wheel is determined by a number of factors which have been extensively covered in other printed material and it need not be explored further at this time. In the contact wheel selector shown in Table II, the various changes recommended to correct various conditions encountered simply use contact wheels of varying degrees of aggressiveness to accomplish the desired results.

NEW TYPE OF CONTACT WHEEL

A recent addition to the contact wheel family which has a very definite role in grinding and polishing for a pre-plate finish as well as for roughing or cutting down is the dual durometer contact wheel recently announced to the trade. This is a wheel made up of a hard base rubber which is serrated in the conventional fashion, but which has the grooves filled with a softer rubber. Such a wheel, designated as Type 86, produces serrated wheel efficiency with all of the other desirable operating characteristics of a smooth faced wheel. While the rate of cut and belt life obtained is equal to and often better than that obtained with conventional serrated wheels, the finish produced is from 1 to 3 grit sizes finer than is normally expected from that grit size, depending upon the type of operation being performed. On flat polishing, for example, the finish produced is approximately 2 to 3 grit sizes finer than is normally obtained from the same belt used on a standard serrated wheel of the same hardness.

If it is necessary or desirable to increase the aggressiveness of such a wheel, it can be accomplished quite easily by cutting or serrating a narrow slot in the soft rubber adjacent to the leading edge of the hard rubber land. This will make the wheel act more aggressive and consequently reduce glazing and loading, while not materially affecting the finish obtained from the same wheel before the narrow groove was cut in the soft rubber. This is known as a Type 81 contact wheel. (Fig. 2)

CONTACT WHEEL PERFORMANCE

Following are some general truths as they relate to contact wheels and their performance:

Hard Wheels—Produce a fast cut, coarser finish, longer belt life and reduced glazing.

Soft Wheels—Slower cut, finer finish, shorter belt life and, in most cases, more rapid glazing.

Although the above is generally true, it is possible to make a soft or medium hard contact wheel act very aggressive under certain circumstances and on certain materials by changing the serration and by other variables in the contact wheel itself.

LOADING AND GLAZING

The difference between loading and glazing of an abrasive belt is generally understood by all who are familiar with abrasive operations. However, in practice, loading is often mistakenly described as a glazing condition while true glazing is rarely described as a loading condition. It is very easy to determine whether or not a belt is loaded on most non-ferrous materials. The load or chip build-up and welding onto the abrasive grains is very evident and, in most cases, very pronounced. However, on many stainless and ferrous materials the abrasive grain has, to all outward appearances, taken on a glazed appearance. In such cases the only sure way of distinguishing between loading and glazing is to attempt to lift the glazed top off the abrasive grains while observing it under a reading or magnifying glass. A scriber point or knife point is usually sufficient for this. If the glazed appearance can be lifted and removed from the tips of the abrasive grains the condition under which this appearance was obtained is a loading condition rather than a glazing condition. In most cases, rather than going to a more aggressive contact wheel to improve the situation, it is simply a matter of using a lubricant or, if a lubricant is already being used, of changing to one having either more lubricity or greater anti-weld characteristics.

LUBRICATION OF ABRASIVE BELTS

Lubricants can and very often do play an important part in the relative success or lack of it on many coated abrasive applications. It is particularly pronounced in abrasive belt applications. Instances have been noted where either the use of a lubricant or a change to a different type of lubricant has made as much as 600 to 800 per cent increase in performance over either a dry operation or the lubricant previously used. Since there are so many components and methods of compounding grinding lubricants and coolants, it is difficult, if not impossible to go into any detail on recommended types for different materials and applications. However, as a starting recommendation, it is generally good practice to use on a grinding or polishing operation a lubricant or coolant of a type similar to that which would be used on the same material for a machining operation such as milling or turning. Be sure that the lubricant or coolant selected is compatible with the bond type in the belts being used. That is to say that a waterproof belt must be used when a water-soluble coolant is used. However, straight grinding oils can be used without harming the bond on either waterproof or non-waterproof belts. For further improvement in the operation through lubrication, it is suggested that representatives from a grinding lubricant and coolant manufacturer be consulted.

An abrasive belt set-up for off-hand grinding.

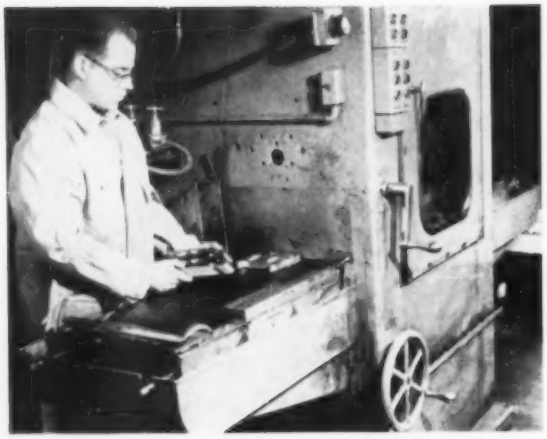
(While this is not particularly applicable to plating, it shows a basic set-up of contact wheel, idler, and abrasive belt, not visible in the photo on the next page.)

GRINDING CHARACTERISTICS

The heat sensitivity or heat conductivity of a metal is generally a rough guide to the machining and grinding characteristics of the material. For example, most non-ferrous materials are good conductors of heat and are very readily ground and machined. Materials such as many of the stainless steels and high alloy materials are generally poor conductors and for the most part, by comparison, are considerably more difficult to grind or machine. This is a general rule but there are materials which by virtue of their composition or heat treatment or both are good conductors but are difficult to grind and machine. An example of this is spherodized steel which, due to its treatment, has a large percentage of iron carbide in its structure which makes it hard on machine tools, as well as abrasive grains so far as productivity is concerned.

IMPROVING THE FINAL FINISH

Final finishing prior to plating or buffing can often be substantially improved both from the standpoint of finish as well as abrasive life by using an abrasive grain type that is not normally used on the particular type of material being ground or polished. For example, aluminum oxide grain is invariably used for grinding and polishing steel of all types. However, the use of silicon carbide on the last operation, in many cases, will produce a finer finish at no loss in production rate and, in most cases, with an increase of belt life over that obtainable from the use of aluminum oxide belts. The general effect of the use of silicon carbide in such a case is to produce a burnishing rather than a true cutting action. The finish produced is considerably finer and much easier to buff out even than the



A simple and effective method of feeding flat parts continuously on a conveyor-type thru-feed machine. Note the squeegee pad used to wipe the conveyor feed belt free of grinding sludge. The abrasive belt, contact wheel and idler are completely enclosed.

same micro-inch finish produced by aluminum oxide grain. This same procedure can be used on material such as cast iron where the cutting is normally done with silicon carbide and the last operation, when performed with aluminum oxide, will produce a glazing condition on the abrasive grain which then produces a desirable finish for buffing.

Grit sizes to be used in these cases are generally as follows. Where aluminum oxide is used for cutting, the last operation using silicon carbide should be of the same grit size as the preceding operation in aluminum oxide. The same is true when silicon carbide is used as the cutting abrasive and aluminum oxide is used for the finishing operation. In some cases it may be necessary to go either one grit size finer or coarser than the preceding grit size used.

SOME OPERATING TECHNIQUES

Belts which are normally used with a mist or fine spray of lubricant or with an oil drip technique will produce better results if the belts are first dipped or submerged in the same lubricant and hung up and allowed to drain dry. This dipping completely saturates the abrasive belt and draining removes the excess. When the belt is put into service, either an oil drip or fine lubricant mist does not have to saturate the belt backing but is available immediately to perform its function at the point of contact between the abrasive tips and the work.

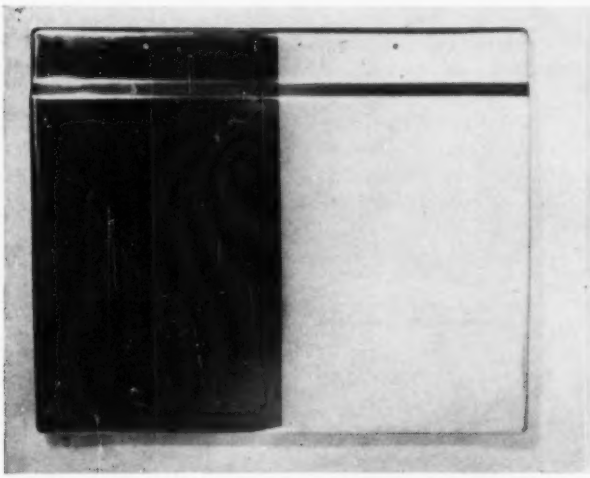
Belts are used on some operations where the edge of the belt receives undue wear which results in shedding and raveling of the belt edge. This is commonly encountered in work where grinding or polishing must be carried right up to a shoulder or projection of the work piece itself. Such a raveling condition soon reduces the width of belt to such a point that the corner of the contact wheel is exposed and soon is rounded off through contact with the work. The belts must then be discarded because they are too narrow for the width of the wheel being used. Savings can often be realized under such conditions by starting with a belt that is wider than the contact wheel and allowing one edge to over-hang the contact wheel while the other edge of the belt is used for grinding or polishing the area next to the projection on the work piece. As the edge of the belt wears and frays the belt is tracked over to the edge of the contact wheel so that the contact wheel edge is covered at all times. This will not only extend the contact wheel life, but in most cases will increase abrasive belt life sufficiently to more than offset the additional cost of the wider belt. In some cases it is necessary to use a belt only $\frac{1}{8}$ to $\frac{1}{4}$ in. wider than the wheel. On the other hand, due to the price structure on belt widths it is often more economical to reduce the width of the contact wheel by the necessary amount rather than use belts which are $\frac{1}{8}$ to $\frac{1}{4}$ in. wider.

Savings can often be realized by moving coarse grit belts which have been pretty much worn out down to the next operation where a finer grit size is used. This is, in effect, obtaining double duty from the same belt.

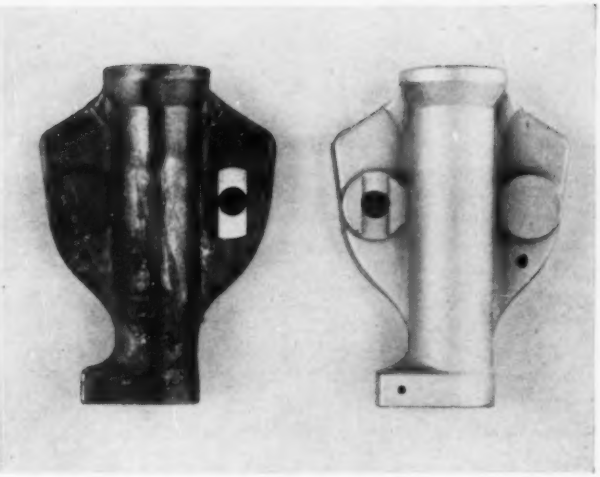
In some instances where a variety of work is performed in the same plant or on the same machine, different parts often require either different contact wheels or different grit sequences, or both. Many times one batch of parts will be completed before the belts are worn out. In such cases it is only common sense and economical practice to remove the partially used belts and store them until that grit size is again needed. Belts which are or have been lubricated, especially if they are finishing belts, should be kept clean and free of any dirt or grinding swarf with which they might come into contact in the belt guard or dust hood. Loose abrasive grains and grinding chips which are picked up by the lubricated belt will, in most cases, be retained long enough to produce wild grit marks and coarse non-uniform finishes on the work which will cause either a high rejection rate or additional work in refinishing.

Grinding and polishing with abrasive belts is not basically an art, it is a science. It is science composed of basic fundamentals pertaining to coated abrasive belt usage in conjunction with common sense and sound judgment. Combining the two in theory as well as practice will invariably result in substantial savings and more economical operation costs.

Warren K. Seward was born in Luzerne, Pennsylvania in 1924. He studied Pre-Engineering at Dartmouth College and Mechanical Engineering at the Illinois Institute of Technology. He received his BS degree in Mechanical Engineering from Case Institute of Technology, Cleveland. Mr. Seward joined The Carborundum Company, Niagara Falls, in 1948 and is now that firm's Supervising Engineer of New Market and Application Development, The Coated Abrasive Division. He resides in Niagara Falls with his wife and three children.



Polished, nickel plated and then wet blasted, this electric range door is shown at left prior to processing and, right, about to be chrome plated.



A before and after picture study. Aluminum fishing reel part directly chrome plated after wet blasting. No intermediary chemical cleaning or zincate deposits were resorted to.

ABRASIVE WET BLASTING

for

CLEANING AND FINISHING METALS

by ALAN R. BURMAN*

ABRASIVE WET BLASTING is performed with the utilization of a compressed air blasting gun to "throw" a mixture of water and abrasive. Water as the carrying medium allows the use of an extremely wide choice of abrasives: quartz, silica flour, novacite, aluminum oxide, silicon carbide, etc., ranging in particle size from 75 to 5000 mesh.

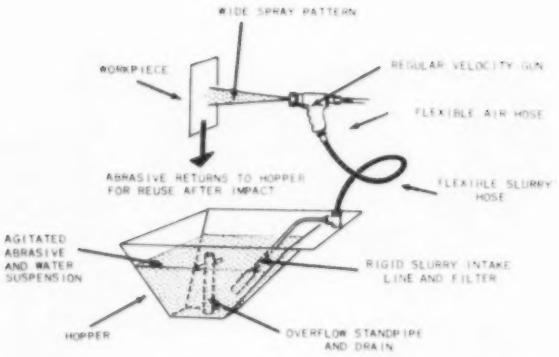
The process is conducted in a completely enclosed cabinet so that the abrasive-water mixture may be continually reclaimed and reused. In simplest terms, the equipment would consist basically of the over-all enclosing cabinet (containing a "hopper" where the main agitation of the water and abrasive takes place), plumbing lines of both copper and high pressure hosing (for the transmission of both free air and the abrasive-water mix) and operating controls.

*Vice President, Cro-Plate Company, Hartford Connecticut.

When manually operated, the blast gun is held by the operator who inserts his arms through arm-ports in the front of the cabinet. Work is admitted through the same arm-ports if the work is small enough, otherwise either of the two large side work-loading doors may be used. Work progress is observed by the operator through a large viewing window equipped with a knee-actuated washing device which keeps it free and clean of abrasive splash.

There are two different wet-blasting methods. The difference is in the velocity of the abrasive-water and air mixture as it is "shot" through and out the blasting gun.

In regular velocity operation, the abrasive-water mix is sucked from the main agitating hopper up through a feed line and into the gun where it meets with air from the shop air line and is emitted through the gun muzzle. This method offers blast speed directly comparable to conventional equip-



Regular velocity blast circuit operates on the suction principle. A venturi, which is fixed inside the blast gun, sucks agitated abrasive slurry up from the main hopper. Speed of the abrasive slurry, as blown, is approximately 680 ft/sec. Note wide spray pattern.

ment. It will clean and finish at a normal rate of speed and is, of course, limited to known and accepted applications.

High velocity wet-blasting is a more recent development. In this system, instead of sucking or pumping inert abrasive-water mix up to the gun as in regular speed operation, the abrasive-water mix is automatically transferred into a pressure tank where it is pressurized and forced at a high speed up to the blast gun. As a result, the speed of the abrasive at the muzzle is more than doubled.

The one basic characteristic of all abrasives used in the wet-blast process is that they are relatively fine in mesh size. The fineness of the abrasive used is one of the fundamental distinguishing characteristics of wet blasting as opposed to dry sand blasting. In wet blasting, water acts as a medium in order to carry these extremely fine abrasive particles which otherwise could not be used in a dry state. Fineness is conventionally measured in mesh numbers and 75 to 5000 is the normal range of wet blast grain sizes. The use of numbers alone in the selection of abrasive for a particular job may be misleading, however, since several different materials or types of abrasive are used. In choosing the right abrasive, in order to achieve a specified finish, the types of abrasive should be selected first . . . then the appropriate mesh size of that particular type.

Whatever the abrasive selected, it should never be used in wet blast equipment in a raw or untreated state. Rust inhibitors, emulsifiers and wetting agents should always be used in combination for:

1. Prevention of rust on parts being wet blasted.
2. Elimination of abrasive packing during "shut down" periods.
3. To insure free rinsing of abrasive from work pieces after wet blasting.

FINISHING AND CLEANING BEFORE ELECTROPLATING

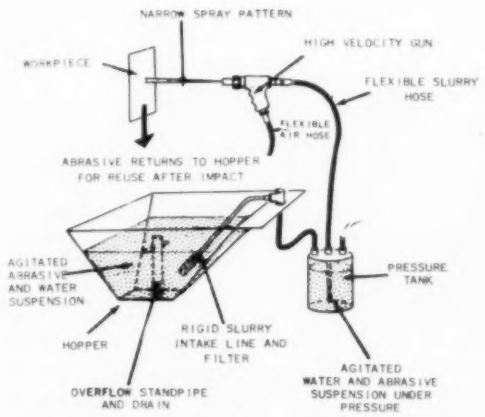
Surface finish and cleanliness prior to plating is of importance to the basic process of electrodeposition in achieving good deposits and bond. Wet-blasting has proved its ability to impart this all-important surface condition quickly and economically even where other pre-plate cleaning methods have failed.

The general effectiveness of electro or non-electro chemical cleaning cannot be disputed. However, in instances involving the removal of tenacious oxides, scales, stains, discoloration, fluxes, which because of their strength or location on the work defy conventional cleaning processes, wet blasting can be counted upon to deliver chemically clean surfaces, completely

Immediately after pressure blasting, left, this rocket head closure sleeve was cadmium plated.

non-directional in character without dimensional loss or the creation of stresses.

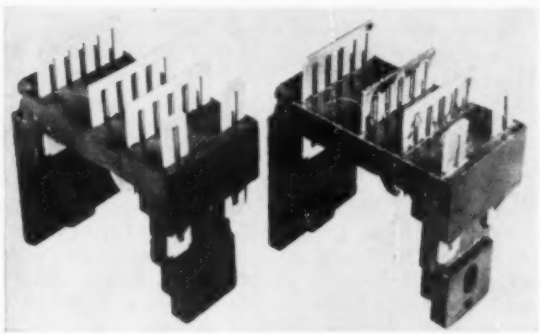
This process is most widely used for finishing prior to hard chrome plate. Here, absolute cleanliness is a "must" and slight surface etch highly desirable for mechanical bond. The tendency of chrome to build up on high points and edges while resisting deposit in recessed areas makes relative surface smoothness equally important. Wet blasting blends directional grind lines and removes feather edges and burrs which would be exaggerated by chrome and become, as a result, points of flaking and chipping during use of final grinding for size.



The high velocity blast circuit uses a pressure tank which delivers agitated abrasive slurry to the blast gun under pressure. This achieves muzzle velocity of 1700 ft/sec. The spray pattern is narrow.

Chrome may be plated directly on basic metal after wet blasting. The resultant plate will have excellent grain structure and adherance properties. Color will be satin or matte. Abrasive wet blast is an accepted method of cleaning when chrome is to be deposited directly on aluminum with no intermediary steps such as the zincate process.

Since hard chrome plate is widely used on moving parts for its resistance to wear, it has been discovered that with light deposits over the microscopically etched, pressure blasted surface lubrication properties are improved. The normally



The metal portions of an electric typewriter part, right, and after they have been cleaned, left, of plastic flash by wet blasting and are ready for silver plating.

"slick" surface of chrome plate will "wet down" more easily and hold lubrication longer. When chrome is used in heavier deposits up to 0.040 in. on the diameter, wet blasting will result in minimized "frosting" or "burning" conditions.

This pre-plating cleaning method has been employed with equal success in cadmium, tin, industrial silver, copper, nickel and other precious metal plating operations. Difficult-to-remove surface oxides and scales which impair the quality of these plates lend themselves to abrasive wet blasting. Basically, all comments made in regard to the use of wet blasting in hard chrome plating hold for these other plates too. There are no limitations to the method except where bright, mirror-like plates are required, for it always results in some degree of matte finish which is duplicated by the deposited plate. There are exceptions to this rule, however. A copper-nickel-chrome sequence or bright nickel bath properly maintained will deposit bright on a matte surface if that surface is smooth enough. The basic limitation of the wet blasting method of cleaning prior to any plating operation is one of production quantity output.

Hard chrome, of course, is usually used on single pieces such as dies, molds, cutters, low production wear parts or as a salvage material. Abrasive wet-blasting cleaning cycle time under these circumstances is short and the part may be handled manually or with some simple work holding fixture. In many instances work may be blasted on the plating fixture since the soft, resiliant fixture coating is not subject to blast wear. Many larger components which are silver plated for electrical conductivity, along with numerous electronic parts requiring precision rhodium, platinum and palladium plates are also low-production items which lend themselves to the adoption of wet blasting as a standard pre-plate cleaning method. The impracticality of wet blasting lies in situations where automatic plating equipment is in use and the expense of matching the tooling of the blasting equipment to keep up with the plating equipment speed is uneconomical.

DECORATIVE FINISHING

The basic attractiveness of the method as a decorative finishing operation lies in its ability to impart uniform, non-directional, non-reflective surfaces. Tool marks, small pits, grinding or polishing lines are obliterated and a matter pattern is set-up. This pattern is duplicated during any subsequent plating or anodizing operations. In certain instances where the directional lines in a scratch brush finish are still desirable, an abrasive of appropriate mesh size may be selected to color without completely blending. Another attribute of the method is that no allowance need be made insofar as the shape of the part to be finished is concerned. The water-borne abrasive stream can be carried into recesses, slots, angles and curves inaccessible to other finishing methods.

COMBINATION FINISHES

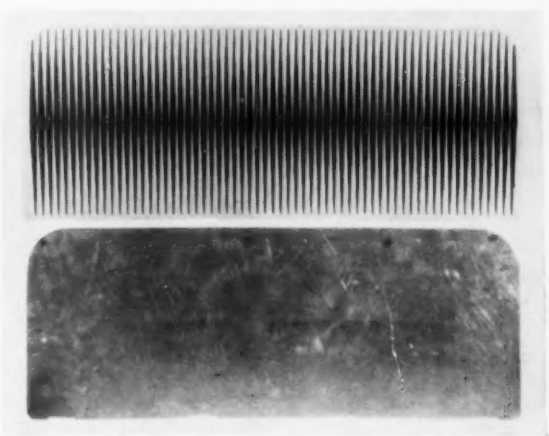
Perhaps wet blasting as a decorative finishing process enjoys its widest application in those instances where contrasting bright and satin finishes are sought. The masks usually required in this type of operation may be metal or rubber although a soft, resilient material such as rubber provides longest life. Silk screening has been used as an effective masking material as have spray paint masks.

The particular type of equipment use for decorative finishing is usually dependent on the production quantities required. Smooth, uniform finishes are obtainable in small, inexpensive, manually operated units with little operator training. In automatic machines, blast guns are normally oscillated by means of an air-draulic cylinder or bell crank and exceptionally uniform finishes can be achieved over large, flat areas. Many automatics include rinsing and drying facilities.

OPERATIONAL AND MAINTENANCE COST

There are five factors contributing to the cost of operating and maintaining wet blasting equipment . . . manual, semi or full automatic:

1. Abrasive
2. Compressed Air
3. Water
4. Replacement of wear parts
5. Electrical power



The aluminum refrigerator panel, bottom, is shown, top, after it was buffed to high luster, the pattern silk screened upon it and then automatically wet blasted, in readiness for clear and color anodizing.

1. Abrasive

The actual cost of abrasive depends on:

A. Type of unit and number of guns incorporated in the equipment
B. Abrasive to be used since abrasives vary in cost.
C. Cleanliness of work pieces presented to the unit.
D. Necessity for uniformity of finish.
E. Capacity of agitating hopper.

Here is a hypothetical example of cost calculation:

1. Type of unit: semi-automatic
2. Number of guns: (3) 20 cfm regular velocity
3. Abrasive to be used: 220 mesh
4. Cost of abrasive: $12 per 50 lb container
5. Capacity of hopper: 50 lb abrasive, 11 gal. water
6. Cost of charging hopper: $12
7. Anticipated abrasive life: 70 hours
8. Number of hours per week to be operated: 40 hours
9. Actual abrasive cost: $7. per week

Anticipated abrasive life figures are based on operation of one 65 cfm regular velocity gun under average conditions. In order to use these published figures in reckoning your own costs, consider the air consumption of your unit in ratio to 65 cfm. For example, if a unit is rated to consume 130 cfm, divide the abrasive life hours by two. If air consumption is rated at 200 cfm, divide abrasive life hours by three (approximately), etc.

2. Compressed Air

The cost of compressed air may be roughly figured in most areas at five cents per thousand cubic feet at pressures of 80–90 lb/sq in. This cost varies proportionately with the cost of electrical power (for compressor motor operation).

Here is the way in which compressed air costs may be figured:

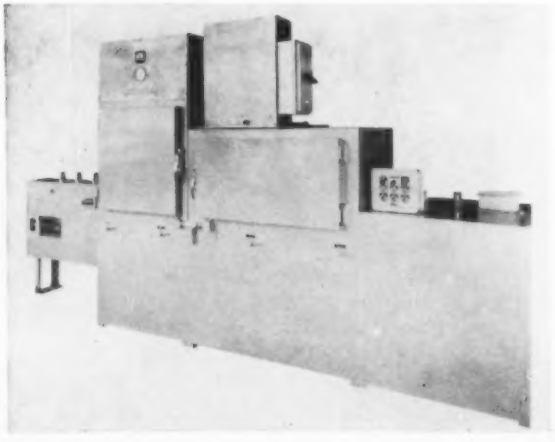
Air consumed by unit: 40 cfm 80–90 psi
Number of hours unit to be operated: 8 hrs

60—minutes (1 hr)
x40—cfm

2400—cf per hr
x8—hrs of operation

19200—cf per 8 hrs
x .05—cost of 1000 cf

$ .96—cost of 19200 of compressed air per 8 hrs of operation (one 40 cfm gun)



3. Water

In manually operated units the only water consumed is that used to charge the hopper (usually 11 gal) and that water occasionally used to wash the window. Under these circumstances, water consumption is so negligible as not to warrant consideration as a contributor to operating costs. In automatic units where hot or cold recirculating rinsing facilities are provided the same fact holds true. Only in automatic equipment where non-recirculating rinse cabinets are employed is water cost a factor. Generally, in this case, consumption may vary from 5–15 gal/min.

4. Replacement of Wear Parts

Following is a list of standard machine parts which will require periodic replacement:

A. Ceramic Inserts.....Regular velocity guns; $1.50 ea.—replace every 200 hr
B. Ceramic Inserts.....High velocity guns; $2 ea.—replace every 75 hr
C. Gun Slurry Hoses....$5.50 ea.—replace every 300 hr
D. Agitator Jets.....$150 ea.—replace every 500 hr
E. Slurry Strainers.....$4.25 ea.—replace every 1000 hr

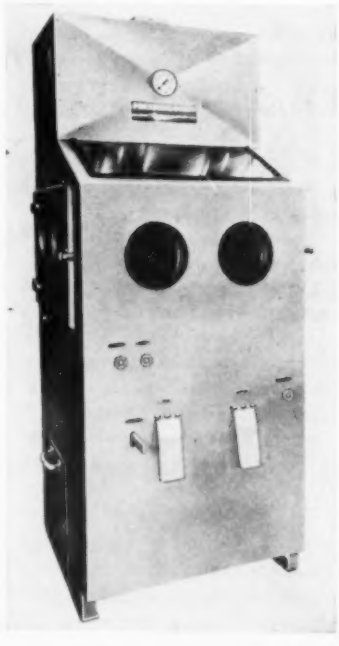
Other components such as the blast guns themselves, high velocity pressure tanks and valving, etc., require replacement only when the equipment is not maintained or operated properly.

5. Electrical Power

If manually operated units, electrical power is required only for the operation of the blower motor which ranges in size from ⅛ to 1 hp dependent upon the unit. Cabinet lighting which again depends upon the type of unit requires anywhere from 20 to 80 watts (fluorescent).

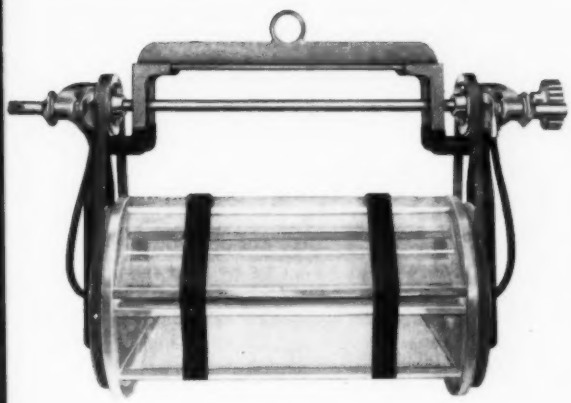
Automatic equipment requires, in addition to blower motor and lighting service comparable to above, electrical power for conveyor or rotary table drive (from ½ to 1 hp), pump motors involved with recirculating rinse facilities, elements employed in heating rinse water and bulbs or elements used in drying ovens.

Standard model wet blast unit. Manually operated, it has two side work-loading doors, includes both regular and high velocity circuits, and occupies 30 by 30 in. of floor space. ➤



◄ Full automatic wet blast installation incorporating an in-line, indexed conveyor with mechanically rotating work-holding spindles, automatic water recirculating rinse system and oiling station. Unloading is automatic.

the NEW STUTZ COMPLETE CYCLE BELT DRIVEN PLATING CYLINDER



MODEL A

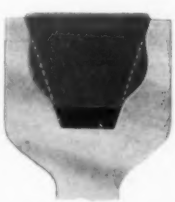
- *No Cylinder Gears* • *No Cylinder Bearings*
- *Lowest Possible Maintenance*
- *Highest Possible Current*

These units are the result of our experience with industry and service plating. The belt design has now proven superior to gear driven types, and with outboard mounted driving pulleys, belts can be changed if necessary, in seconds without tools. In addition to our own equipment these units made to fit all makes of plating tanks and furnished also with motor drives mounted directly on cylinder superstructure. Cylinder current horns are heavy copper alloy and are sized for either four or three horn saddle contact. Cathode contactors are dangler type, others available. Standard sizes 14″x30″ and 14″x36″ (I.D.), 12 additional sizes from 12″x24″ to 18″x42″ (I.D.) Standard perforations 3/32″ round on 3/16″ centers. Special dual openings for processing of extremely small parts available.

This design incorporates cylinder pulleys separate and smaller from the cylinder head. The hanger arms are semi-steel castings protected with 5/16″ thick special vulcanized hard rubber.

Specially designed counter pulleys of monel metal or plexiglas with deep dimples for positive grip against belt face.

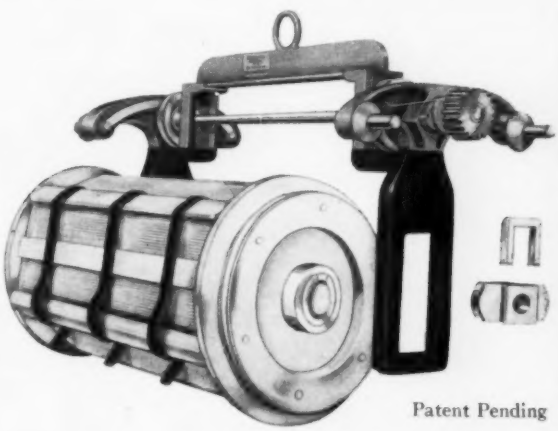
Pat. Pending



This shows the belt expanding into the dimples of the driving pulleys. This action provides positive pull with no abrasion to the belt whatsoever.

Patent Pending

Simply lifting the top piece vertically from the dangler holder, allows the holder to be withdrawn through the hanger slot. This releases the cylinder from the hanger.

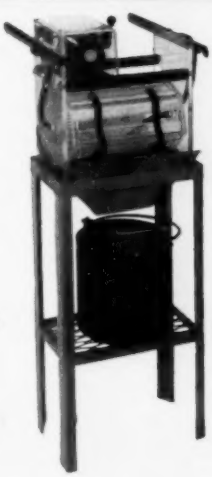


Patent Pending

STUTZ PORTABLE PLATING BARRELS

★*Baskets in perforated metals or wire mesh.*

★*Load/Unload Stand for convenient and fast handling of work load.*



The Stutz Portable Barrel is made in 2 standard sizes with cylinders having inside dimensions of 6″x12″ and 8″x18″ I.D. Smaller upon application. Standard openings are 3/32″. Smaller or larger openings can be furnished as required.

Write for Catalog and Prices — *We Invite Your Inquiries*

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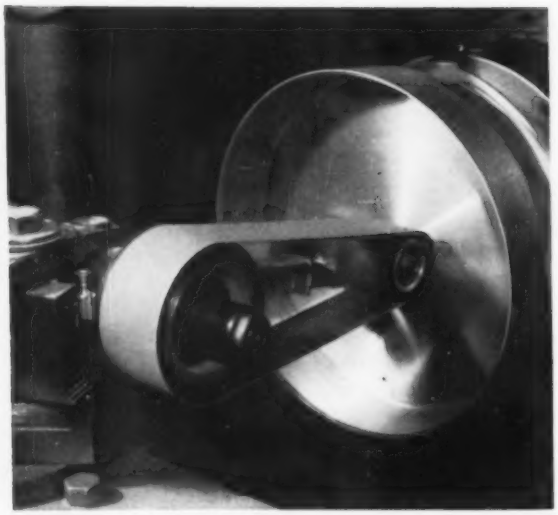
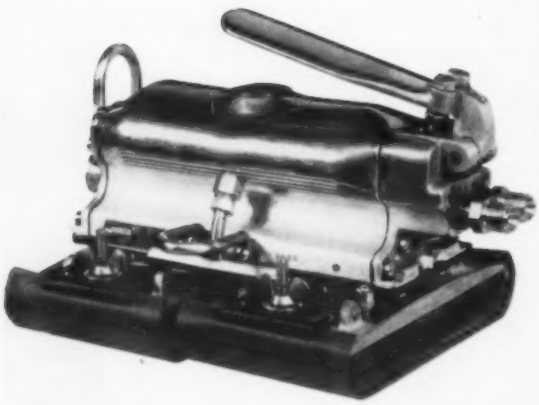
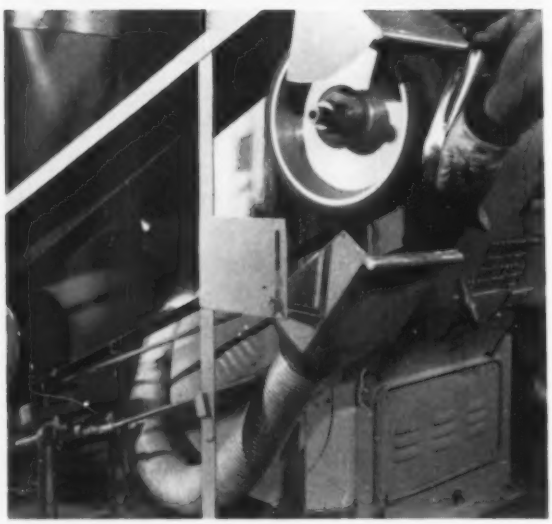
Complete Metal Finishing Equipment and Supplies







(Top) Polishing the inside of a skillet prior to plating. **(Center)** Air-operated reciprocating pad sander, uses standard 3½ by 9 in. sheets of abrasives. **(Bottom)** Typical offhand polishing operation on a well-engineered backstand with floor-mounted idler.

LET'S CUT FINISHING COSTS

by LELAND H. VORCE*

ANY MAN IN THE PLATING BUSINESS is also in the metal finishing business. The quality of his plating is determined by the quality of the finishing he gets in his polishing room. And, startling as it may seem, all but a very few plating plants in this country can reduce their reject rates and cut production costs sharply by improving their pre-plate polishing.

There is nothing mysterious about the way to accomplish this cost-saving. It takes improved methods, better equipment and better abrasive materials, all developed in recent years. It also takes the know-how born of actual work on hundreds of polishing lines and thousands of parts, each with its own peculiar problems. Few men in industry have had the time or opportunity to gain such familiarity with polishing techniques, yet it's exactly this broad experience that's required if the job is to be analyzed accurately, and costs cut to the greatest extent.

To enlist it, the plater need only avail himself of the counsel offered by abrasive manufacturers. This consultant service is available for the plater's process or methods men, and in the small shops, for the superintendent or foreman.

In recent months, there have been instances where annual savings of $25,000 to $250,000 have been effected. One midwest manufacturer who invested in an automatic straight-line polishing setup is saving $45,000 annually. On his job, one operator is producing more than 400 polished pieces per hour—and the part weighs pounds, not ounces.

These savings represent lessened labor cost, and the expense of maintaining set-up wheel rooms; those two items quickly wrote off the cost of the equipment—an almost daily occurrence in modern industry.

Current practice in large plating plants involves the most modern backstand equipment, newly improved contact wheels, and recently developed resin-bonded abrasive belts as well as newer lubricants. Also, many plants are using new

* Product Engineer, Detroit, Behr-Manning Company, Troy, N. Y.

equipment such as conveyorized belt polishers, large flat polishing units, semi-automatic and automatic straight-line and rotary machines as well as many small portable tools, electric or air-driven.

But, in the biggest shops, process engineers are not immune from wasteful practices. In the plant of a large manufacturer of plated hardware was found a bewildering variety of abrasive belt sizes, grits, and contact wheel densities in use. A comprehensive study of polishing requirements allowed this manufacturer to reduce his grit range to sensible proportions, cut contact wheel densities to three, and belt widths to four —99 per cent of his belts confined to three widths. Better yet, one entire polishing line was found to be using only the center portion of its coated abrasive belts. Actually, 70 cents was being thrown away every time a belt was discarded. The cure was obvious, and narrower belts are now being used.

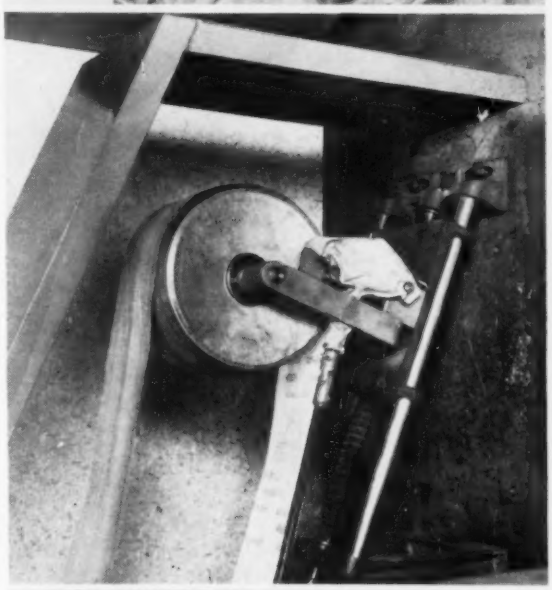
In all, this plant cut its belt costs more than 50 per cent, and produced even greater savings by replacing its costly set-up wheels. Compared with set-up wheels or set-up belts, the coated abrasive belt has a powerful advantage in the cost area because the overhead is included in the price of the belt. In contrast, making up and breaking in the set-up wheel before it can even be used requires expensive skilled labor.

Moreover, the coated abrasive belt offers a large saving by reducing the number of rejected parts. These rejects add up to one of the biggest costs in polishing because the rework of a polished piece costs approximately three times as much as the original work. Remember, the job is to remove the defects such as scratches, pits and so on—not to fold them in on the surface so that they pop up again when exposed to the heat and acid of the plating process. The coated abrasive belt removes them readily and with fewer operations because its extreme sharpness is built in. This property contrasts directly with grinding wheels and set-up wheels which cannot provide the necessary sharpness.

Because the coated abrasive belt involves fewer operations than does the set-up wheel, it cuts labor costs sharply. The element of skill is reduced considerably by selecting the proper belt, grit, size, density of contact wheel or platen, correct surface speed and the proper grinding aid or lubricant. Thus there remains only the ability of the operator to handle the part. The need for high skill has largely disappeared.

When the plating or finishing executive suspects his operation can be improved, or that costs are getting out of line, the first step is to examine the problem and check the results being obtained. Methods and equipment tests probably will be needed. These can be made at clinic rooms of abrasive manufacturers, maintained to permit actual comparison testing.

When such studies disclose operating weaknesses and plant corrections have been made, production timing is measured and surface finishes studied to obtain desired buffing-out performance and platability.



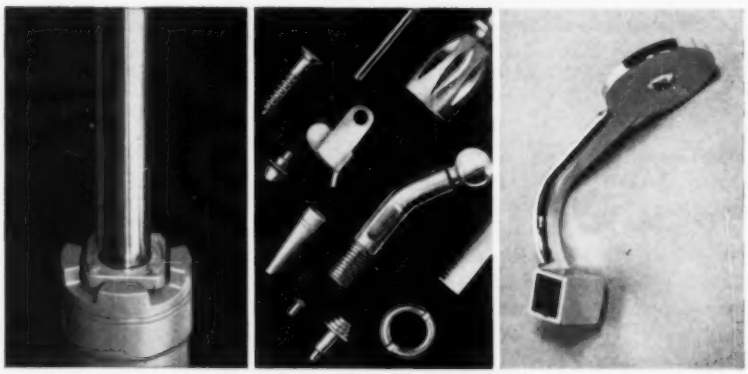
(Top) Dual-action sander, air operated, uses 4 or 5 in. aluminum oxide paper discs to polish out imperfections while leaving virtually no grit lines. The disc spins in a clockwise direction while the whole polishing head rotates slowly counterclockwise. **(Center)** Fenlind idler exercises control of tension as well as tracking. A boot keeps out abrasive dust and dirt. **(Bottom)** Changing a belt on a straight-line conveyor type belt grinder and polisher.

UNICHROME
Trade Mark

News about
COATINGS for METALS
Metallic.....Organic.....Decorative.....Protective

Chromium plating goes "specialized"

Deposits and bath characteristics matched to different needs



Chromium plating can be matched to different production and deposit requirements. Examples: (Left) Hydraulic rams get increased resistance to corrosion with Crack-Free Chromium. (Center) Quality is assured on barrel plated small parts by a special SRHS Bath. (Right) Both operations and results are improved in decorative plating with SRHS Chromium.

Meeting today's demand for more automation and specialized production "tools," M&T offers a *line* of processes to satisfy any chromium plating need. "Chromium is chromium" cannot be considered an accurate statement any longer. Chromium can differ in the *way* it is deposited and in *nature* of the deposit.

THE DIFFERENCES

Unichrome Crack-Free Chromium is a new type of *ductile* deposit in that it is free from the cracks riddling ordinary chromium. It affords more corrosion protection, reduces nickel need. It also withstands thermal shock better, and improves wear resistance. Thus, it is being used where electrodeposits formerly proved inadequate. Crack-Free Chromium, like all other Metal & Thermit chromium solutions, is self-regulated or "automated."

For other requirements, Unichrome SRHS® Chromium Baths have the advantages over ordinary chromium of wider bright plate range, self regulation for optimum plating balance, up to 80% more speed. While the SRHS deposit is similar to ordinary chromium structurally, the *way* it plates makes a substantial difference in the output. It permits plating more work per load, cuts rejects due to missing and burning.

VARIOUS SOLUTIONS

The SRHS line offers a number of different solutions with varied operating characteristics. This selection makes possible exact cost-reducing and quality-improving matches between plating solution and production requirements. Developed especially for barrel chromium plating, one bath in the group assures lower cost high quality finishes on volumes of small parts.

All a plant needs is a tank and electrical service. Metal & Thermit can round out the installation with experienced technical aid and the only complete line of processes and equipment for the requirements.

A BARREL OF SAVINGS IN SMALL PARTS PLATING

The *continuous* Unichrome plating barrel designed by Metal & Thermit is a real production tool. It equals 4 batch type barrels in output; plates up to 200 pounds of parts per hour. It offers "automation" to plants that must chromium plate hundreds of thousands of small parts per day.

• • • • • • • •

Immersion heater uses tough tantalum

An advanced type of electric immersion heater developed by M&T uses an acidproof tantalum tube to protect the heating element, promote good heat transfer. This tantalum sheath eliminates cracking such as may be encountered with brittle quartz heaters. Thermostatically controlled, the unit is rated at 5 KW, develops 17,000 Btu/hr—enough heat to raise 100 gallons of water 20°F per hour.

Send for data on above equipment.

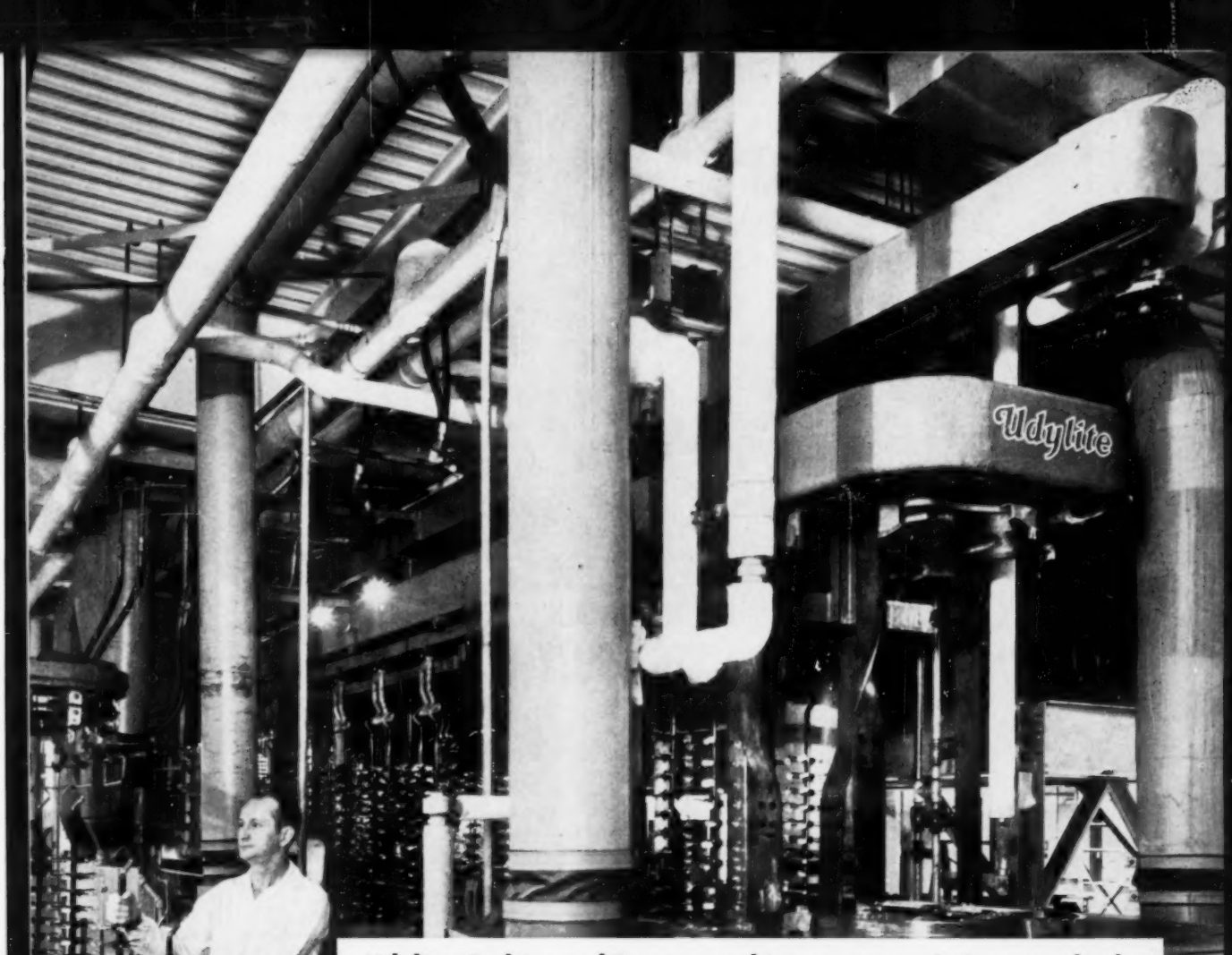
Unichrome is a trademark of Metal & Thermit Corp.

METAL & THERMIT
CORPORATION

General Offices: Rahway, New Jersey
Pittsburgh • Atlanta • Detroit
East Chicago • Los Angeles
In Canada: Metal & Thermit—United Chromium of Canada, Limited, Rexdale, Ont.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 126.

INDICATE A 127. ➤



Udylite Machine and Process combine to set new Scripto standards

The Udylite Cyclemaster provides the accuracy and steady flow of production. Udylite Bright Nickel furnishes the sparkling finish. Together they solve for Scripto, of Atlanta, Georgia, the knotty problem of better finish of the Scripto pens, pencils and cigarette lighters.

Scripto's first bright nickel was the Udylite #31 process. It was superseded by the Udylite #514 process to gain the faster brightening which is so important in nickel plating to a high luster with a thin coat.

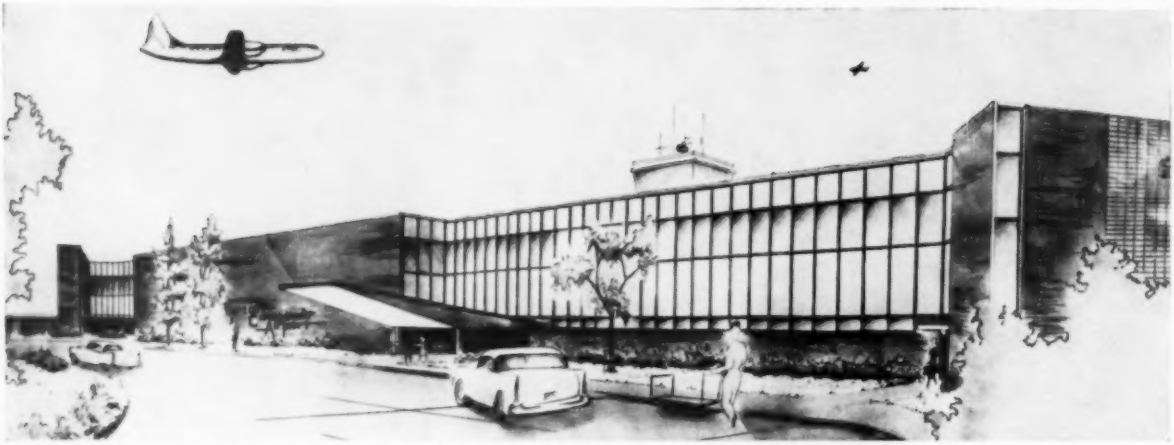
The adoption of Udylite Bright Nickel Process #724 was the next step as it offered still faster brightening and even more important all the time saving advantages of all liquid brighteners.

Step by step Scripto has lowered costs and improved quality with Udylite Processes and Precision Automatic Plating. Here is just one of many examples of the right application of process and equipment. Out of the line of Udylite products can come the answer to your problem as well.

Contact your local Udylite Sales Representative . . . let him show you how the *right* combination of Udylite processes and machines can improve your quality and production.

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER



Expansion at the Greater Cincinnati Airport will present this new look to the Terminal Building.

CINCINNATI'S EASY ACCESSIBILITY BY AIR, RAIL, ROAD

The very thing that brought the first settlers to Cincinnati's locale in 1788—*easy transportation*—will convenience your plans to attend the 45th Annual Convention in Cincinnati, May 19–22, 1958.

In those days, it was the broad Ohio that carried the pioneer Westward, and it still offers a restful and novel trip by river steamboat to those in the Pittsburgh and St. Louis areas. The beautiful Ohio is appropriately named, and each year finds more and more vacationers taking advantage of our Inland Waterways.

Electroplaters are busy people, however, and the more conventional methods of transportation will undoubtedly be more popular. These follow.

AIRLINES: The Greater Cincinnati Airport is serviced by five major airlines, namely American Airlines; Delta Airlines; Trans World Airlines; Piedmont Airlines and Lake Central Airlines. Typical fares to Cincinnati are as follows:

To Cincinnati from	Round Trip First Class (incl. tax)	Round Trip Air Coach (incl. tax)
Boston	$97.13	$82.94
Chicago	37.00	24.20
Cleveland	31.35	—
Detroit	33.55	—
Los Angeles	258.94	191.40
New York	78.10	62.26
Philadelphia	71.17	56.76
Pittsburgh	39.16	31.46
St. Louis	43.78	35.20
Washington, D. C.	55.44	52.14

RAILROADS: Cincinnati's Union Terminal is the home for seven major railroads, namely New York Central; Pennsylvania; Baltimore & Ohio; Louisville & Nashville; Chesapeake & Ohio; Southern and N. & W. Typical fares to Cincinnati are as follows:

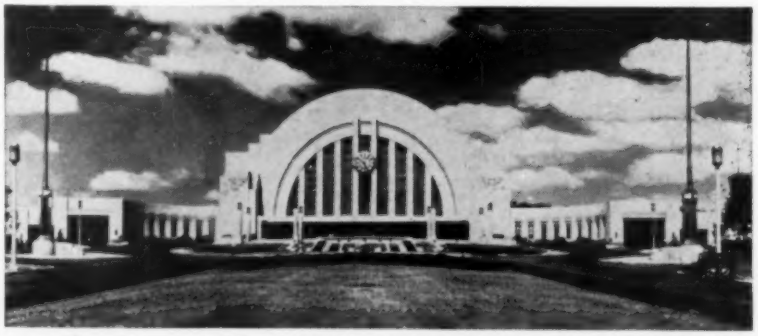
To Cincinnati from	Round Trip First Class (incl. tax)	One-way Lower Berth (incl. tax)
Boston	$111.27	$15.84
Chicago	36.47	8.91
Cleveland	31.57	8.91
Detroit	31.57	8.91
Los Angeles	174.57	26.62
New York	88.39	13.42
Philadelphia	77.72	9.57
Pittsburgh	37.79	8.91
St. Louis	42.24	6.38
Washington, D. C.	57.57	7.37

AUTOMOBILE: Cincinnati is favorably located for the trip by auto. A radius of 500 miles encompasses most of the electroplating centers in the country. Many of these can utilize the modern expressways for a part or most of the distance.

The highway picture changes too rapidly to suggest routes. Some of the mileage figures may be of interest, and we list these as follows:

To Cincinnati from	Distance (AAA)	Driving Time (AAA)
Boston	857 miles	25 hrs. 35 min.
Chicago	297 miles	8 hrs. 20 min.
Cleveland	244 miles	7 hrs. 10 min.
Detroit	254 miles	6 hrs. 55 min.
New York	673 miles	19 hrs. 40 min.
Philadelphia	585 miles	16 hrs. 40 min.
Pittsburgh	287 miles	7 hrs. 55 min.
St. Louis	341 miles	8 hrs. 30 min.
Washington, D. C.	489 miles	13 hrs. 15 min.

"Vas You Efer in Zinzinnati?" Treat yourself and family to the values and pleasures of the 45th Annual Convention. *You'll be so glad you did!*



Conventioneers traveling to Cincinnati by train will arrive at Union Terminal.

TENTATIVE PROGRAM

45th ANNUAL CONVENTION
AMERICAN ELECTROPLATERS' SOCIETY, INC.

Hotel Sheraton-Gibson, Cincinnati, Ohio
May 18-22, 1958

As prepared by the Cincinnati Convention Committee and approved by the Executive Board, this is the TENTATIVE program as of January 1, 1958. It is subject to additions and modifications to be reported in following issues of PLATING magazine.

SUNDAY, MAY 18

10:00 a.m.	Executive Board Meeting
2:00 p.m.	Trustees' Meeting, Metal Finishing Suppliers' Assn. (MFSA)
4:00 p.m.	Credentials Committee
8:00 p.m.	Get-Together Party

MONDAY, MAY 19

10:00 a.m.	Opening Session
11:00 a.m.	Business Meeting, Supreme Society
12:00 noon	Luncheon Meeting, (MFSA)
12:00 noon	Branch Secretaries' Luncheon
12:00 noon	Ladies' Luncheon
12:15 p.m.	Speakers' Luncheon
2:00 p.m.	First Educational Session
2:30 p.m.	Editorial Board Meeting
6:30 p.m.	Past Presidents' Dinner
9:00 p.m.	Open House (MFSA)

TUESDAY, MAY 20

8:00 a.m.	Membership Committee Breakfast
8:00 a.m.	Speakers' Breakfast
9:00 a.m.	Second Educational Session
10:00 a.m.	Public Relations Committee Meeting
10:00 a.m.	Other Committee Meetings (to be scheduled)
12:00 noon	Outing at Coney Island
12:00 noon	Golf Tournament at Kenwood Country Club (MFSA)

WEDNESDAY, MAY 21

8:00 a.m.	Research Committee Breakfast
8:00 a.m.	Speakers' Breakfast
9:00 a.m.	Third Educational Session
9:00 a.m.	Fourth Educational Session
9:00 a.m.	Research Committee Meeting
9:00 a.m.	Educational Committee Meeting
12:00 noon	Branch Librarians' Luncheon
12:00 noon	Ladies' Luncheon
12:00 noon	Speakers' Luncheon
2:00 p.m.	Research Committee Meeting
2:00 p.m.	Fifth Educational Session
2:00 p.m.	Sixth Educational Session
9:30 p.m.	Floor Show and Dance

THURSDAY, MAY 22

8:00 a.m.	Speakers' Breakfast
9:00 a.m.	Seventh Educational Session (Panel: "Practical Plating Problems")
9:00 a.m.	Business Meeting, Supreme Society (All Day)
12:00 noon	Ladies' Luncheon
2:00 p.m.	Ladies' Party
7:00 p.m.	Banquet and Dance

CONVENTION PAPERS

At its Cincinnati meeting, February 26, the Editorial Board will select and approve the technical papers to be delivered before the 45th Annual Convention from among these now being finalized:

1. EFFECT OF SHOT-PEENING PRIOR TO CHROMIUM PLATING ON THE FATIGUE STRENGTH OF HIGH STRENGTH STEEL
2. ELECTROLYTIC PREPARATION
3. LOOSE ABRASIVE FINISHING
4. AES PROJECT NO. 14—MECHANICAL POLISHING OF THE BASIS METAL AND ITS EFFECT ON THE CORROSION RESISTANCE OF A WATTS NICKEL DEPOSIT
5. HARMFUL EFFECTS AND TREATMENT OF IMPURITIES IN SEWAGE
6. THE USE OF BIOASSAYS IN THE SAFE DISPOSAL OF ELECTROPLATING WASTES
7. ION EXCHANGE AND THE PICKLING OF MAGNESIUM SHEET
8. INDUSTRIAL WASTE TREATMENT AND WATER RECLAMATION
9. PRINCIPLES OF ELECTRO-CHEMISTRY
10. CLEANING, PICKLING AND PREPARATORY SURFACE TREATMENT
11. TYPICAL PLATING SOLUTION—CYANIDE ZINC
12. FACTORS AFFECTING THE CHARACTER OF ELECTRODEPOSITS
13. PLATING ROOM POWER
14. ENGINEERING AND INSTALLATION IN THE PLATING ROOM
15. PLATING RACK—DESIGN AND INSULATION
16. THE ROLE OF ACCELERATED TESTS IN THE PAINT FINISHING FIELD
17. USE OF PLASTISOLS AND ORGANISOLS AS DECORATIVE FINISHES
18. WHEN AND HOW TO SELECT AN ORGANIC COATING
19. CLEAR FINISHING OVER COPPER, ZINC, BRONZE, CHROME, ETC.
20. SOME COMMON CAUSES OF PREMATURE PAINT FILM FAILURE
21. HARD ANODIZING OF ALUMINUM
22. ELECTRODEPOSITED METALLIC AND FLAME SPRAYED CERAMIC COATINGS FOR ELEVATED TEMPERATURES
23. A METALLURGICAL APPROACH TO RESIDUAL STRESS IN ELECTRODEPOSITED METALS
24. ALLOY PLATING SYSTEMS FOR AIRCRAFT ENGINES
25. PITTING IN HARD CHROMIUM PLATING
26. NI-CHEM
27. INSTRUMENTATION
28. BRONZE ALLOY PLATING
29. DECORATIVE CHROME PLATING
30. PATTERN PLATING WITH ELECTRODEPOSITS
31. (PRESENTLY UNNAMED)

●

PANEL DISCUSSION:
PRACTICAL PLATING PROBLEMS
Dr. Abner Brenner (Moderator)

PANEL MEMBERS:
PREPARATION OF BASE METALS:
Dr. A. Kenneth Graham
CONVERSION COATINGS & MILITARY REQUIREMENTS:
Lloyd O. Gilbert
CORROSION:
Dr. Harold Read
DECORATIVE PLATING:
(To be Named)
ANODIZING AND PLATING ON ALUMINUM:
(To be Named)
SPECIALTY WORK, JOB SHOP OPERATION:
H. F. Smith

AES NEWS

W. K. Murray

Edward Bruck

M. H. Dent

AES'S 57 BRANCH DELEGATIONS ACCREDITED

As a result of yeoman effort by the Credentials Committee in collaboration with the Society's National President, Executive Secretary and the Law Committee Chairman, the certified Delegates/Alternates of 57 Branches were accredited on schedule thereby enabling the work of the Supreme Society, the AES's governing council, to speed forward.

This year's special handling was necessitated by the Bylaw amendment effected by the Supreme Society in Montreal last June setting the tenure of Delegates/Alternates to span from the first Branch meeting following the Society's Annual Meeting (June 20, 1957) to the next such Branch meeting a year hence. Each Branch was required to certify its delegation to the National Executive Secretary by November 4, 1957. Because of the difficulties to some Branches of transition this first year, this deadline had to be extended to November 27.

The Credentials Committee, by special effort, completed its task of accreditation in time to enable President Francis T. Eddy to issue the official Notice of Interim Meeting to all accredited Delegates on schedule. Each such Delegate and Alternate, moreover, received his copy of the new "Delegates Manual" promptly upon accreditation as now required by the amended Bylaws.

Edward Bruck of Indianapolis heads the Credentials Committee whose personnel includes Marmaduke H. Dent of Miami, Florida, and William K. Murray of Meriden, Connecticut.

APROPOS OF THIS SOCIETY'S GOVERNMENT

The Constitution and Bylaws of the American Electroplaters' Society, Inc. (AES), as amended by the Supreme Society at its Montreal Annual Meeting, June 20, 1957, was published in full in September 1957 PLATING for the immediate information and benefit of the Society's current membership in all ramifications.

Members were cautioned that because of the volume and complexity of amendments enacted at that meeting by the Supreme Society, some minor errors may have crept into that published document. PLATING assured that any such inadvertences discovered would be corrected by published errata. The following are the sole such inadvertences discovered:

1. **CONSTITUTION, ARTICLE IV, SECTION 2: Insert the sentence, "Each elected officer shall further be a Delegate" after the very first sentence.**

2. **CONSTITUTION, ARTICLE VIII, SECTION 3: Insert, "and Alternate" between "Delegate" and "and each Branch President and Secretary."**

In mid-November, copies of the book, BUSINESS PROCEEDINGS (1957 Edition), embodying the full Minutes of that Montreal Annual Meeting of the Supreme Society were distributed among Delegates/Alternates and Branch Presidents/Secretaries as required by the AES's Constitution.

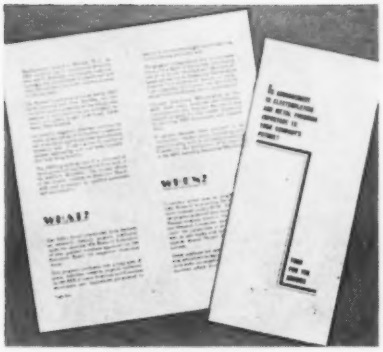
AES'S NEW BOOKLET STATES DELEGATES' DUTIES

Above, the booklet "Delegates Manual" recently published by National Headquarters and disseminated among all Branch Delegates and Alternates as an assist to them in understanding the duties and responsibilities of membership in the Supreme Society, the AES's summit governing council. Published and distributed as required by the Society's amended Bylaws, the text of the little booklet was prepared by Past President William J. Neill. Apart from Branch Delegates and Alternates who received it immediately after their accreditation, copies, for information purpose, were also sent to Branch Presidents and Branch Secretaries.

AES NATIONAL HEADQUARTERS PERSONNEL

MISS KATHRYN H. LANGAN

Equipped with long, comprehensive bookkeeping and financial experience and a solid corporate record, Miss Langan entered the AES's employ in September 1957 as Office Accountant and financial right arm of the Executive Secretary.



NEW BOOKLET PORTRAYS AES'S RESEARCH PROGRAM

The AES's Research Program, developed over a long span of years, embodies research projects sponsored by the Society at many American and Canadian universities and foundations pinpointed to specific improvements sought in electroplating, metal finishing and allied arts. The program is financed not only by allocation thereto of a share of the annual membership fees of the AES's Active Members and Members-at-Large but also by the Sustaining Memberships carried by a substantial number of progressive industrial companies at the rate of $100 per such membership per twelve-month period.

Through their Sustaining Memberships, these many American and Canadian companies not only help pay the cost of the Society's important cooperative Research Program but also benefit themselves by receiving AES educational and research data.

As an assist to AES Branches, particularly Branch Research Finance Chairmen, in interesting companies in their areas having a stake in the progress of electroplating, metal finishing and allied arts to cooperate in the Research Program by applying for Sustaining Membership, the Research Committee has just published a new booklet on the subject titled, "Is Advancement in Electroplating and Metal Finishing Important to your Company's Future?" If interested in the subject and desire a free copy, write American Electroplaters' Society, 445 Broad Street, Newark 2, N. J.

SUCCESSFUL RESEARCH CONFERENCE HELD IN WASHINGTON

Over forty stalwarts of the AES's Research Program, including members of the Research Committee; District Supervisors; Project Chairmen and Project Directors attended the two-day successful Research Conference held in Washington, D. C., December 10–11 with Project No. 13 as Host Project. February PLATING will carry a full story on this pioneer conference.

CHICAGO BRANCH COMPLETES PREPARATIONS FOR BANNER 46TH ANNUAL MEETING

On Saturday, January 25, Chicago Branch, AES, will hold its 46th Annual Educational Session and Banquet at Chicago's Conrad Hilton Hotel.

The three technical papers scheduled for the Educational Session at 2 p.m. in the Waldorf Room are to be presented by prominent authorities. Dr. Neal Berts, director of research of the Diversey Corp., will speak on "Deep Etching." This process of chemical milling has replaced machine milling in much of the aircraft industry, and has been used successfully on aluminum, magnesium and stainless steel base metals.

Dr. Burleigh B. Gardner, executive director of Social Research, Inc., has chosen as his topic "The Importance of Finishing and Packaging in Selling." His background—consultant to management, personality analyst, former lecturer at the University of Chicago, personnel researcher at Western Electric Co.—qualifies him admirably to determine the effect of various types and qualities of finish on the consumer and purchasing agent.

The history, processing and finishing of magnesium will be presented by Dr. Henry A. Evangelades, research metallurgist at Frankfort Arsenal, in his paper "H. A. E. Process for Treatment of Magnesium."

AES National Past President Clyde Kelly is the chairman of this annual affair which will be culminated with the banquet and floor show in the evening.

Boston Branch Leads at 8-Month Mark

At the eight-month point, namely from April 1, 1957 to December 1, 1957, the Boston, St. Louis and Hamilton (Canada) Branches lead the field in their respective divisions in the AES's annual Branch membership expansion competition.

Meantime, the Society's aggregate membership, in all classifications including Sustaining Memberships, stands at a record 7,688 members as of December 1, 1957 compared with the 7,183 member total as of December 1, 1956.

An award of $50 is presented yearly by the Society at the Annual Convention to those Branches in three divisions achieving the greatest membership expansion during the twelve-month period commencing April 1. At the current eight-month point, the five leaders in the AES's respective divisions are:

BRANCH MEMBERSHIP COMPETITION

Branch	Members April 1, 1957	New Members	Net Change Membership	Per Cent Change
First Division (126 Members and Over)				
1. Boston	140	13	+ 8.5	+ 6.1
2. Toronto	179	13	+ 9.5	+ 5.3
3. Waterbury	142	7	+ 7	+ 4.9
4. New York	345	21	+16.5	+ 4.8
5. Hartford	173	13	+ 8	+ 4.6
Second Division (70-125 Members)				
1. St. Louis	99	19	+10	+10
2. Cincinnati	106	12	+10	+ 9.4
3. Montreal	107	23	+ 9	+ 8.4
4. Buffalo	114	4	+ 3	+ 2.6
5. Baltimore-Washington	101	3	+ 2.5	+ 2.5
Third Division (10-69 Members)				
1. Hamilton	33	8	+ 6	+18.2
2. San Francisco	69	10	+12.5	+18.1
3. Kansas City	44	7	+ 7.5	+17
4. British Columbia	38	6	+ 6	+15.8
5. Miami	26	11	+ 3	+11.5

PROGRAMMING OF CINCINNATI CONVENTION EDUCATIONAL SESSIONS PROGRESSING—At its Detroit Meeting, December 6, the Editorial Board (above) reviewed the abstracts of proposed technical papers to be delivered before the Educational Sessions of the 45th Annual Convention to be held in Cincinnati, May 19–22, 1957, and authorized a tentative list of 31 such papers to be completed for final approval and selection at that Board's Cincinnati Meeting, February 26, 1958. The list is presented on Page 53. The Board left to the Cincinnati Host Branch Educational Committee, the determination of the number of Educational Sessions to be held and their scheduling. It approved a panel session on practical plating problems to be conducted on Thursday Morning, May 22. Among other business transacted, it also commenced preliminary work with Walter L. Pinner, Host Branch Educational Chairman, on the Fifth International Conference on Electrodeposition and Metal Finishing to be conducted by the Golden Jubilee Convention of the AES in Detroit in June 1959 with the Detroit Branch as Host.

SOCIETY'S NEW MEMBERSHIP COMMITTEE LAUNCHED—Organizational meeting of the Society's new Membership Committee at Detroit, December 7. Focused upon expanding AES membership in all ramifications, the Committee will provide generalship and coordination to the membership promotion program of the Society, with initiative and action still left, of course, to Branches as always. Ralph D. Wysong, Acting Chairman, spearheaded the Committee's organization. Manuel Ben, Detroit, was elected Chairman; Robert L. Garrett, Kansas City, was named Secretary. The Committee fashioned its Bylaws and laid plans for immediate acceleration of membership promotion, including preparation of a new Membership Promotion Visual Aid. Left to right, Mr. Garrett; George E. Best, Baltimore-Washington; James E. Cogan Jr., Philadelphia; George W. Taylor, Southeastern; Mr. Wysong; Mr. Ben; Philip J. Ritzenthaler, Milwaukee; S. A. Frost, Montreal.

DETROIT'S 20TH ANNUAL EDUCATIONAL SESSION

•

NATIONAL OFFICERS' NIGHT

(Left to right) James D. Thomas, Detroit Branch Educational Chairman; Glenn H. Friedt Jr., Detroit Branch President; Francis T. Eddy, National President and Technical Chairman; Dr. W. Andrew Wesley, Speaker and National 3rd Vice President.

AES National and Detroit Branch Officers at dinner preceding the Educational Session. Standing at the head of the table are the National Officers and Detroit Branch President. Not present when picture was taken, National President Francis T. Eddy.

(Left) Part of the large attendance of members and visitors at the 20th Annual Educational Session of the Detroit Branch on National Officers' Night, December 6. (Right) Dr. W. Andrew Wesley, International Nickel Co., delivering his paper, "Nickel-Chromium vs. The Atmosphere."

PREVIEW OF FUTURE PLATING ISSUES

MARCH 1958

ORGANIC COATING. As last year's edition, this issue will feature organic finishing.

APRIL 1958

TECHNICAL RESEARCH. Not only will this issue spotlight recent developments in the AES Research Program but will also be the pre-1958 ANNUAL CONVENTION feature issue.

MAY 1958

CONVENTION ISSUE. Inasmuch as the 1958 Annual Convention will be held in Cincinnati, Ohio, May 19–22, this feature issue will come in May instead of June as customary.

JULY 1958

POST CONVENTION ISSUE. Among other features, it will contain a pictorial and narrative account of the 45th Annual Convention.

AUGUST 1958

WATER AND WASTE TREATMENT. Another edition of this informative and popular feature.

NOVEMBER 1958

AIRCRAFT. Electroplating and metal finishing in the aviation industry will be featured in this second annual edition.

THE FEBRUARY, JUNE, SEPTEMBER, OCTOBER and DECEMBER issues loom as strong 1958 General Issues.

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Acid Copper Sulphate
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Instrument-Automation Conference Planned for Philadelphia

The Instrument Society of America is already at work developing new and outstanding plans for its 13th Annual Instrument-Automation Conference and Exhibit scheduled for Sep. 15–19, 1958 in Philadelphia at Convention Hall.

With a membership of more than 10,000, the Society is the only technical group of its kind in America devoted exclusively to the technology of instrumentation and automatic controls. Its annual show attracts more than 500 exhibitors displaying the latest developments in this technology.

A concurrent series of clinics, workshops and technical sessions will again be featured during the exhibit week. The technical sessions conducted by leading authorities cover every phase of the industry.

The Society is dedicated to advancements in instrumentation and automatic controls, and their many applications to every segment of industry and the military.

Four Floors of Chemical Exhibits

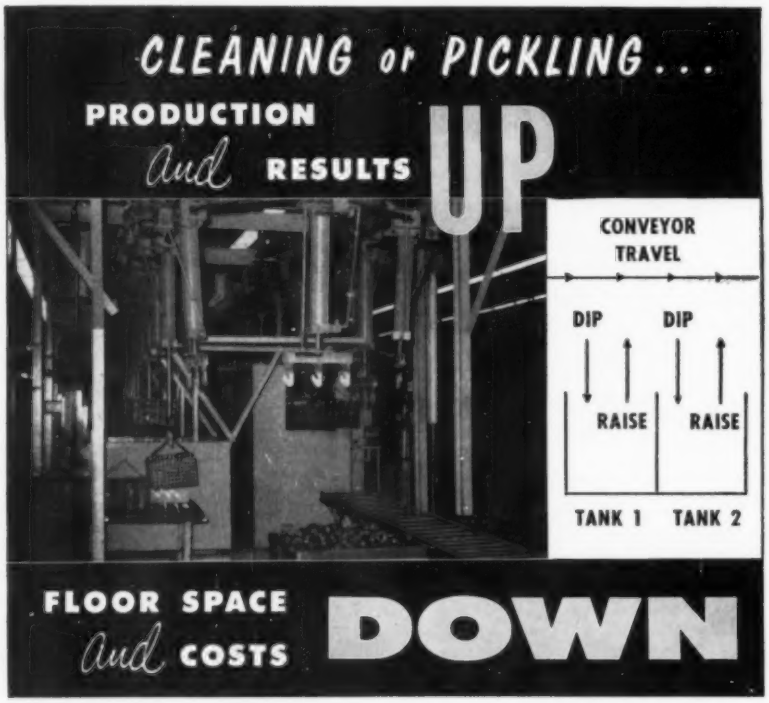
The 26th Exposition of Chemical Industries revealed that research has paved the way for great accomplishments in chemistry and chemical engineering and for many industries outside the chemical field. Never were the close alliances of chemistry with all the industrial arts more forcibly demonstrated than at the chemical exposition at the New York Coliseum the entire week of December second.

All four floors of the Coliseum were filled with exhibits of chemicals and chemical materials, materials of construction, chemical processing equipment and unnumbered special facilities for converting the elements of nature to the uses of man. Exhibits revealed the newest chemical products, the latest equipment for producing them. Many were first-time presentations of materials and equipment only just emerging from the laboratories and pilot plants into full-scale production.

Among exhibits of chemical materials were several of the metallic salts, showing their application. One group applied to coating materials, ceramic glass opacifiers, high dielectric-constant ceramic powders, soluble zirconium salts, high temperature refractories, titanium carbides, abrasive grains and glass polishing materials.

A rhodium plating solution, which is just going into commercial production, was a new offering for the electroplating industry.

Exhibits of laboratory equipment and supplies included a wide variety of furniture and equipment for the laboratory, whether for scientific study or production control.



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Opportunity to Authors

Member or non-member authors of technical and scientific papers on electroplating, metal finishing and related arts are cordially invited to submit manuscripts of original, unpublished papers to the Editor of PLATING for review and publishing consideration.

Any such paper accepted and published in PLATING will also be eligible, of course, for selection by the Society's Paper Awards Committee for the Carl E. Heussner Award; AES Silver Medal; AES Bronze Medal; George B. Hogaboom Memorial Award; Robert S. Leather Mechanical Finishing Award; Chromium Plating Award; Precious Metal Plating Award, or the John J. Hanney Memorial Award.

So as to expedite review and other processing, please write the Editor, PLATING, 445 Broad Street, Newark 2, New Jersey, for full particulars before submitting your manuscript.

Plant Maintenance Show To Attain New High

One of the nation's largest expositions and one of the best attended engineering conferences attest to the growing attention by industry to the problems of maintenance.

The Plant Maintenance and Engineering Show, scheduled for the International Amphitheatre, Chicago, Jan. 27–30, will include exhibits valued at more than $7,500,000 and almost 10,000 different products. Twenty thousand executives from 30 countries are expected to attend.

The concurrent conference on maintenance and engineering, which will be held at the Amphitheatre and the Palmer House, Jan. 27–29, will attract more than 2500 engineers. Sixty-six speakers drawn from 22 states, the District of Columbia and Canada will address the 25 sessions.

Metal Show to Cleveland for 1958

A gate attendance of over 64,494 was recorded by the National Metal Exposition and Congress at its 39th Metal Show which concluded in Chicago Nov. 8. The show was held in the International Amphitheatre while the more than 175 scientific sessions convened in the Palmer House and Hotels Sherman and Morrison. Adding to the international aspect of the metal show were 535 metal scientists from overseas.

W. H. Eisenman, secretary of the American Society for Metals, announced the 1958 Metal Show will be held in Cleveland, Oct. 27 to 31. The 3rd World Metallurgical Congress is to be held in Chicago in 1962.

Vacuum Coaters Meet

The first fall meeting and technical conference of the Society of Vacuum Coaters was held at the Statler Hotel in Cleveland, Ohio, on Oct. 30 and 31, 1957. Approximately 150 attended.

The Executive Committee elected consists of T. LaBounty, Logo, Inc., president; C. Northrup, Consolidated Electrodynamics Corp., vice president; R. Lux, General Electric Co., secretary; L. Storms, Red Spot Paint and Varnish, treasurer; and M. Adler, F. J. Stokes Co.; F. Dalton, Vac-Art, Inc.; H. Farrow, National Research Corp.; B. Hineline, Haloid Co.; C. Matilo, Vacuum Metallizers; J. Sims, Delco Remy.

ASME Holds Annual Meeting

Seven thousand engineers and others concerned with new developments in fast-growing technical fields gathered in New York Monday, Dec. 2, at the Hotels Statler and Sheraton-McAlpin for the largest meeting ever sponsored by The American Society of Mechanical Engineers.

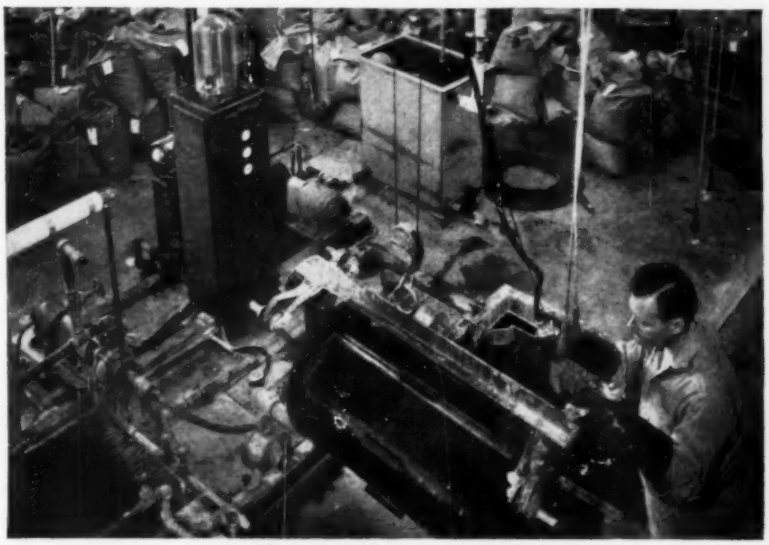
More than 400 technical papers, speeches, symposia and other events were crowded into the five-day event which ended on Friday, Dec. 6. On most days, as many as 15 simultaneous sessions were held from 9:30 a.m. to 10:30 p.m. in order to cover the vast amount of technical information presented.

In addition to exchanging information on technical achievements, the engineers discussed methods of improving the organization and efficiency of America's technical specialists, a topic given new importance by the nation's current effort to retain technological superiority.

(*Continued on page 69*)

CINCINNATI CONVENTION

MAY 19-20



Cyanide waste treatment system in plating room of the Palnut Co., Mountainside, N. J.

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PATENT ABSTRACTS

DR. D. GARDNER FOULKE
Manager, Electrochemical Development
Hanson-Van Winkle-Munning Co
Matawan, New Jersey

Copies of patents may be obtained by writing to Commissioner of Patents, Washington, D. C. Price 25 cents each.

No. 2,800,440, 7/23/57—Electrodeposition of Nickel—H. Brown, assignor to Udylite Research Corp., Detroit, Michigan.

The use of alkyne sulfonic acids (3–14 carbon atoms) as nickel brighteners is claimed.

See also No. 2,800,441 (14 claims) describing the use of alkynoxy alkane carboxylic acids (5–15 carbons) along with class II brighteners for bright nickel plating.

See also No. 2,800,442 (16 claims) describing the use of unsaturated sulfonic acids with 3–14 carbon atoms (aryl alkyne, and alkyne aryl).

16 claims.

No. 2,800,707, 7/30/57—Aluminum Coating Steel—M. Whitfield, et.al., assignors to Whitfield and Sheshunoff, Inc., Garden City, New York.

To form a high strength bond between aluminum and steel articles, first coat with a barrier metal (Mo, Wo, and mixtures of the two) before dipping in the molten aluminum.

10 claims.

No. 2,801,187, 7/30/57—Diffusion Alloys—P. Galmiche, assignor to O.N.E.R.A., Chattelon-sous-Bagneaux, France.

A protective iron fluoride is formed on the ferrous body after which said body is brought into contact with metal halides (Cr, Mo, Wo, Ni, Co, Ti, Al) at elevated temperatures.

6 claims, figure.

No. 2,801,194, 7/30/57—Aluminum Soldering Flux—R. Doerr, assignor to Olin Mathieson Chemical Corp., Va.

The flux consists essentially of a zinc chloride complex salt of a pyrazoline halide (pyrazoline and substituted pyrazoline) and 10–50 weight per cent of ammonium halide or hydrazine hydrohalide.

See also No. 2,801,195 with 6 claims and No. 2,801,196, with 11 claims.

15 claims.

No. 2,801,213, 7/30/57—Electroplating on Titanium—F. Beuckman, and Wm. Tucker, assignors to Eastman Kodak Co., Rochester, N. Y.

The titanium is cathodically cleaned in an alkaline electrolyte, activated by immersing in aqueous stannous chloride, covered

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with a thin copper deposit by immersing in a copper sulfate solution. Copper is then plated on the titanium article by plating from a copper sulfate—Rochelle salts—triethanolamine bath at a *p*H of 10.

1 claim.

No. 2,801,214, 7/30/57—Chromium Plating Bath—Melvin Zell, Cleveland, Ohio.

The bath claimed contains: 100 to 500 g/l of chromic sulfate, 100 to 500 g/l of chromic sulfate, 100 to 500 g/l of urea, 50 to 300 g/l of a substance selected from the group consisting of ammonium, potassium and sodium sulfate and 1 to 100 ml of foramide.

3 claims.

No. 2,801,215, 7/23/57—Electrolytic Cleaning—H. Webster, assignor to Kolene Corp., Detroit, Mich.

A process for electrolytic cleaning of ferrous metal consists of immersing said metal in a molten salt bath of 75 to 99.5 per cent by weight of alkali metal hydroxide, the remainder being at least 0.5 per cent of alkali metal fluoride and silicate to form at least 0.5 per cent by weight of alkali metal fluosilicate and cleaning by passing current through said metal serving as an electrode.

12 claims.

No. 2,801,935, 8/6/57—Chemical Deposition of Metals—J. Owen, assignor to Merck and Co., Inc., Rahway, New Jersey.

Mirrors such as silver may be treated simultaneously with a solution of a copper salt and a solution of a tartaric acid salt of hydrazine to form a copper backing over the silvered surface.

6 claims.

No. 2,801,943, 8/6/57—Aluminum Solder Flux—M. Freeman, assignor to Horizons, Inc., Princeton, New Jersey.

An aluminum soldering paste is described as 80 per cent reaction type chloride flux, between 0.1 and 0.5 per cent stearylamine and the rest methanol.

8 claims.

No. 2,801,944, 8/6/57—Soldering Flux—R. Muir, et. al., assignors to Heintz Mfg. Co., Philadelphia, Pa.

A flux for soldering evaporator tubes without introducing moisture into them consists essentially of boric acid and a fluorinated refrigerant.

5 claims.

No. 2,801,959, 8/6/57—Antimony Plating—Arthur DuRose, assignor to The Harshaw Chemical Co., Cleveland, Ohio.

The bath consists of an aqueous solution of an antimonyl complex (tartrate, gluconate, and mixtures thereof), the sodium salt of a hydroxy acid (gluconic, tartaric) and sodium hydroxide in an amount to produce a *p*H of 8.5 to 13.0.

11 claims.

No. 2,801,960, 8/6/57—Gold Plating—R. Seegmiller, assignor to U. S. A. (AEC).

The bath consists of about 15 to 50 g/l of gold cyanide, 70 to 125 g/l of potassium cyanide and 0.1 to about 10 cc/l of sulfonated castor oil. The temperature given is 50 C to 70 C. The disclosure describes the deposit as smooth, semi-hard, bright and non-porous.

7 claims.

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No. 2,801,961, 8/6/57—Tarnish Remover—H. Treece, assignor one-half to J. Goddard and Sons, Ltd., Leicester, England.

Silver articles having a secondary metal also exposed can be freed of tarnish in a bath containing an acid stronger than hydrosulfuric acid and 1 per cent of thiourea or thio-semicarbazide.

7 claims.

No. 2,801,963, 8/6/57—Testing Device for Plating Characteristics—R. Hull and J. Winters, assignors to Ann F. Hull and Adrian Medert as co-trustees, Cleveland, Ohio.

A plating cell device essentially for running Hull cell test panels in a plating bath is described.

7 claims, figure.

No. 2,801,965, 8/6/57—Plating Rack—J. Monshan, assignor to Western Electric Co., Inc., New York, New York.

A plating rack with a hollow flexible element which may be inflated to position articles and to help mark portions of said articles.

3 claims, figure.

No. 2,802,559, 8/13/57—Conveying Mechanism—Paul Hauch, assignor to Hanson-Van Winkle-Munning Co., Matawan, New Jersey.

A conveyor is described by which work pieces are advanced to successive stations at which said workpieces receive various treatments in seven claims and four figures.

No. 2,802,726, 8/13/57—Selectively Removing Metal from a Metal Part—W. Langsfeld, assignor to Turco Products Inc., Los Angeles, California.

Claim 1 states: "A method of substantially equally and correspondingly etching metal parts with an etching solution which comprises securing a pair of said parts together in back to back relation so as to mask the adjacent back surfaces of said parts, said parts having respective opposite surface portions exposed for attack by said etching solution simultaneously immersing said parts in an etching solution with the plane of said backs substantially normal to the surface of said solution, said parts being introduced into and withdrawn from the solution at a rate selected to vary the period of immersion and amount of attack of the etching solution on different sections of the exposed surface portions of each of said parts, corresponding opposite sections of the exposed surface portions of said parts, with reference to the surface of the solution, being thereby etched substantially the same amount."

8 claims.

No. 2,802,758, 8/13/57—Method of Cleaning—T. Kearney, assignor to Detrex Corp., Detroit, Michigan.

The method consists of passing the work-piece in a zone of chlorinated solvent, removing and submerging it in a bath of liquid chlorinated hydrocarbon and carrying it through a zone in which ultrasonic waves are generated. See also No. 2,802,476 describing an apparatus to do this (7 claims, figure).

19 claims, figure.

No. 2,802,779, 8/13/57—Electrodeposition of Nickel—W. Cowle, et. al., assignors to S. A. Vickers, Ltd., London, England.

Claim 1 states: "An electrolytic bath for use in the electrodeposition of a metal selected from the group consisting of nickel and nickel-base alloys which comprises an aqueous solution of a

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nickel salt selected from the group consisting of nickel sulphate and nickel sulphamate and an inorganic chloride selected from group consisting of sodium chloride, and potassium chloride, in which the amount of nickel salt is equivalent to a nickel concentration of at least 3.0 oz/gal and the amount of inorganic chloride is approximately eight times greater by weight than the amount of nickel present in the nickel salt."

8 claims.

No. 2,802,780, 8/13/57—Tin-Copper-Cadmium Electroplating—R. Shockley, assignor to Platalloy Corp., Kokomo, Ind.

A mirror-bright finish is obtained by electroplating metal articles with an alloy deposit of tin, copper and cadmium. This is done by immersing the article as a cathode in an aqueous solution of 10.2 to 12.0 oz/gal of potassium stannate, 1.8 to 2.4 oz/gal of cuprous cyanide, 0.06 to 0.75 oz/gal of cadmium oxide, 5.5 to 7.5 oz/gal of sodium cyanide, 2.7 to 3.0 oz/gal of sodium hydroxide and 2.0 to 5.0 oz/gal of boric acid at 120 to 140 F.

1 claim.

No. 2,802,782, 8/13/57—Anode—R. Bayes, et. al., assignors to American Platinum Works, Newark, New Jersey.

An extruded silver anode is described having bulbous enlarged ends.

5 claims, figure.

No. 2,803,096, 8/20/57—Buffing Wheel—S. Mockiewicz, assignor to American Buff Co., Chicago, Illinois.

Claim 1 states: "In a buffing wheel having a plurality of radially extending buffing fingers, the improvement which comprises constructing each finger of an elongate strip of coarsely woven sisal fabric, said strip being cut on the bias and longitudinally folded to form a core, a tightly woven soft fabric cover, said cover being cut on the bias and transversely enfolded around the sisal core, said enfolded core and cover being longitudinally folded along a central bright portion in such a manner that all longitudinal edges of both the soft fabric and sisal fabric are internally disposed, said finger being longitudinally stitched to maintain said sisal core and said soft cover in juxtaposed integral relationship."

See also No. 2,803,097, assigned to American Buff Co. and describing a combination sisal and cotton buff in 5 claims and 5 figures.

5 claims, 7 figures.

No. 2,803,559, 8/20/57—Hard Surfacing—W. Rutherford and H. Griswald, assignors to Coast Metals, Inc., Little Ferry, New Jersey.

A method of hard surfacing is described wherein the material is dropped on the tool and caused to be fused thereto by induction heating.

5 claims, figure.

No. 2,803,572, 8/20/57—Soldering Flux—O. Konig, assignor to National Lead Co., New York, New York.

The flux consists of (1) hexamethylene-tetramine salt of a volatile acid and (2) a volatile alkaline agent to provide a neutral *p*H in solution.

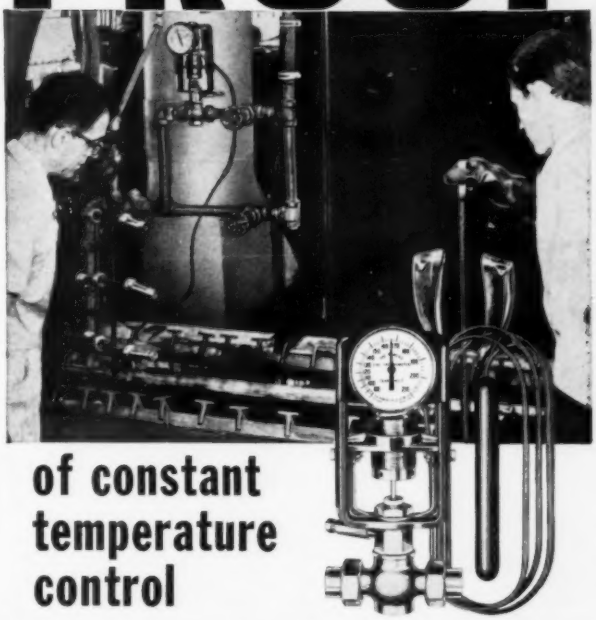
7 claims.

No. 2,803,593, 8/20/57—Electroplating of Cadmium—LeRoy High and W. Hague, assignors to Udylite Research Corp., Detroit, Michigan.

The commercial problem of pitting in cyanide cadmium bath is described in the disclosure and a bath is claimed containing at least 0.01 g/l of at least one of the compounds selected from the group consisting of monosulfated monoleate esters, di-sulfated dioleate esters and sulfated oleic acid is effective against pitting.

6 claims.

VISIBLE PROOF



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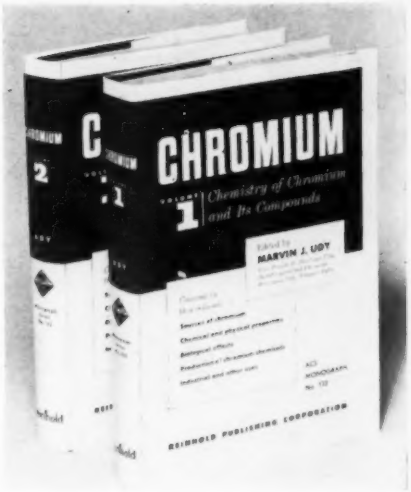

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No. 2,803,596, 8/20/57—Electrocleaning Vanadium—C. Brown, assignor to Union Carbide Corp., New York, New York.

The vanadium article is made the anode in an electrolyte consisting of alkali metal carbonates and alkali metal bicarbonates.

12 claims, figure.

No. 2,805,192, 9/3/57—Plated Refractory Metals—S. Brenner, assignor to General Electric Corp., Schenectady, New York.

Tungsten and molybdenum and alloys of these metals are first plated with copper and zinc, then the zinc is volatilized by heating in a non-oxidizing atmosphere at 900 to 1000 C, after which a metallic ferromagnetic film is plated over the dezincified residual copper film.

19 claims.

No. 2,805,193, 9/3/57—Bright Copper Plating—J. Beaver, Piqua, Ohio.

The use of a thiazine dye (methylene blue, Capri blue, Nile blue, etc.) as a brightener in acid copper baths is described. See also No. 2,805,194, by same inventor and C. Abbott, assigned to Dayton Bright Copper Co., Dayton, Ohio. This patent describes the use of a triphenyl methane dye in acid copper baths and has 12 claims.

20 claims.

No. 2,805,195, 9/3/57—Electrolytic Manganese—J. Jacobs, et. al., assignors to Union Carbide Corp., New York, New York.

Manganese can be plated in a dense form from a manganese and ammonium sulfate solution containing sulfur dioxide as a stabilizer when 20 to 70 g of potassium sulfate is added per liter.

2 claims.

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No. 2,805,530, 9/10/57—Finishing Apparatus—Paul Schaffner, assignor to Schaffner Manufacturing Co., Emsworth, Pa.

The single claim describes the buff as:

"An abrasive article of manufacture particularly for polishing irregular surface, a wheel comprising a plurality of helically wound plies of flexible abrasive coated fabric in the nature of emery cloth which are folded along a median line and constricted along said line to form an annulus of pleated plies extending loosely from the inner to outer periphery, said inner periphery being mounted on a pair of disks which cooperate to clamp and support said annulus upon a power driven arbor, all of said plies being coated with abrasive."

9 figures.

No. 2,805,915, 9/10/57—Arsenic Boron Compounds and Methods of Inhibiting Corrosion Therewith—G. Rohrback, assignor to Crest Research Laboratories, Seattle, Washington.

An inhibitor of acid attack on ferrous metal surfaces is described as;

$$X_2 B_4 O_7 \cdot 2 As_2 O_3$$

where X is a cation selected from the group of alkali metals and ammonium.

15 claims.

No. 2,805,965, 9/10/57—Method of Producing Metal Compounds on Metal—P. Robinson, assignor to Sprague Electric Co., North Adams, Mass.

To deposit a dielectric film of a metal compound on metal, direct a stream of vapors of an organic hydroxy salt of said metal onto the surface of the metal object which is heated to a temperature which causes the impinging vapors to decompose into a solid compound of said metal.

4 claims.

No. 2,805,969, 9/10/57—Oxalate Coatings on Metallic Surfaces—E. Goodspeed and R. Gibson, assignors to Parker Rust Proof Co., Detroit, Michigan.

A solution for forming an oxalate surface conversion coating is described as containing oxalic acid, 4 per cent to saturation, chloride ion, 3.6 per cent to about 12.1 per cent and 0.025 per cent to 9 per cent of molybdenum (molybdic acid given in the examples).

8 claims.

No. 2,805,985, 9/10/57—Electrodeposition of Plutonium—F. Wolter, assignor to U. S. A. (Atomic Energy Commission).

Plutonium is deposited from dilute aqueous solutions containing plutonium ions by electrolyzing at 0.44 amp/sq cm at a *p*H of about 5.0 in the presence of an acetate-sulfate buffer on a stirred mercury cathode.

1 claim.

No. 2,805,986, 9/10/57—Making Fine Mesh Screens—H. Law, assignor to U. S. A. (Army).

Fine screens can be made by electrodeposition upon a master consisting of a conductive base member, a layer of aluminum, a layer of copper and a layer of aluminum with V grooves cut through the top aluminum and copper layers to the second aluminum layer. The aluminum is of the type which prevents electrodeposition thereon.

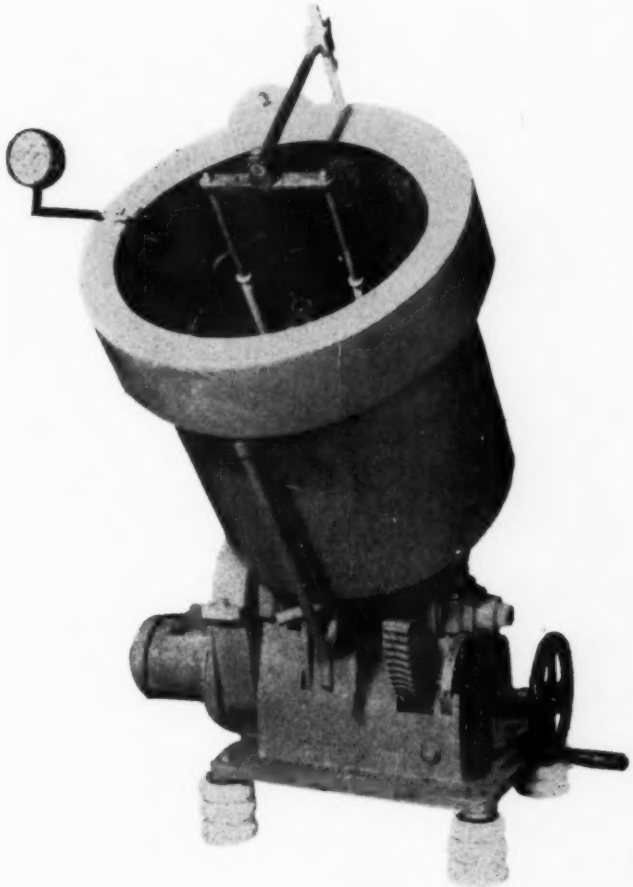
1 claim.

No. 2,806,000, 9/10/57—Cleaning Stainless Steel—M. Streicher, assignor to E. I. duPont de Nemours and Co., Wilmington, Delaware.

Stainless steel may be cleaned in a phosphorus acid solution, up to about 85 per cent, by adding a ferritic ion-contributing salt, other than iron halide, in the amount of 1.0 to 10.0 g/l of ferric ion.

6 claims.

(*Continued on page 74*)



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INTERSOCIETY NEWS

(Continued from page 61)

Materials Handling Conference

A national conference on materials handling, the first to be sponsored by the American Society of Mechanical Engineers since 1949 will be held in conjunction with the National Materials Handling Exposition at the Public Auditorium, Cleveland, June 9 to 12, 1958.

This move is in accordance with the society's policy of encouraging its professional divisions to sponsor separate national conferences devoted to serving engineers in the specialties of their particular fields.

Describing materials handling as the "backbone of automation," John C. Somers, chairman of the society's materials handling division, declares "the need for a new appraisal of this fast growing engineering science is an imperative one.

"Few engineering problems which face management today are as important as materials handling. Only ten years ago it was virtually unknown as an important factor and some of the practices and equipment adopted became outmoded almost as soon as installed. The need for a new appraisal of this fast growing engineering science is an imperative one and we believe the ASME can provide the leadership for bringing about some balance in this field.

"Despite a decade of constant effort, materials handling remains one of the few places where substantial cost reduction can be effected. Materials handling is the backbone of automation. Progress toward the goal of the automatic factory will be slow unless a true science of moving materials is developed. This means reliance, not on one type of equipment, but on a system which uses the most appropriate equipment for the specific need."

Leonard Heads NAMF Membership Drive

A. T. Leonard, president of Superior Plating Inc., Minneapolis has been named to lead the first annual drive for members of the National Association of Metal Finishers. Head of one of the largest job plating firms, Mr. Leonard started part time with his present firm at the age of 12, working his way through high school. He attended the University of Minnesota Evening School for ten years and worked full time at Superior Plating, pursuing courses in chemistry and metallurgy. He has taken several courses in business administration at the Harvard School of Business.

The 45-year-old NAMF drive chairman now employs more than 300 people. His firm does more than $3 million a year in sales and his 150,000-square foot plant does no manufacturing.

Active in local and national affairs, Mr. Leonard is a member of the Electroplating Industry Advisory Committee; past president of the Twin Cities Branch, AES; and past chairman of the Twin Cities Chapter, Young Presidents' Organization. Mr. Leonard is also a part-time lecturer at the University of Minnesota.

The member sign-up period is between February 1 and March 31, 1958. Drive highlight is the official kickoff, slated for January 25, 1958, at the Conrad-Hilton Hotel, Chicago, where chairman Leonard will meet with divisional chairmen and local members.

Wide Use of Molybdenum Seen

Broad development of a new family of metal-ceramics to conquer the heat barrier, with wide use of molybdenum, is predicted by Dr. Lorig of the Battelle Memorial Institute, Columbus, O.

Metallurgical progress in solving heat problems of the next 25 years were included in the predictions of Dr. Clarence H. Lorig, technical director of Battelle, at the opening of a new Elgin National Watch Co. plant.

The predictions along with others in various fields, were placed inside a time capsule, set to open 25 years from now, during dedication ceremonies at Elgin's new micronics division research and development center in Chatsworth, Calif.

He foresaw wide use of molybdenum, tungsten, tantalum, and columbium base alloys both in composite structures with ceramics and in all-metal structures in which molybdenum and tungsten will be protected by metallic self-healing coatings or uncoated in a few instances where conditions are not oxidizing.

He predicted that achievement of materials with improved ductility and elevated-temperature strength will have been based largely on better theoretical understanding of the solid state rather than the trial and error approach by which present high-temperature materials are developed.

GOOD OPERATION

Cowles NS cleaner first... then barrel plating!

Our advertising agency looked in on this job plating shop with us one day and it didn't take a spyglass to find the Cowles NS drums. And it's no wonder, because this large plater* has been ordering NS and other Cowles cleaners by the truckload for years. He says NS speeds his operation . . . cleans the tough jobs as well as the easy ones . . . eliminates rejects.

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BOOKS

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Methods for Emission Spectrochemical Analysis, 504 pages, October 1957, Cloth Bound, Non-members $7.00; Members $6.30.

This second edition brings up to date the first extensive compilation of emission spectrochemical methods published by ASTM in 1953. It covers the spectrochemical analysis of the most important ferrous and non-ferrous metals and alloys. Suggested practices are included on the installation and safe operation of a laboratory, specifying excitation sources, designating shapes and sizes of electrodes, sampling, and computations. More than 800 spectral line pairs, tested in continuous laboratory applications, are provided.

In addition to the 65 suggested practices and methods, there are 16 recommended practices and tentative methods. This compilation presents the pertinent information for each method to permit its application in various laboratories and with different types of equipment. Each of the methods follows the same form of presentation so that similar steps in different procedures will be found in corresponding labeled sections under each method. Particular emphasis has been placed on specifying spectral exposure conditions, excitation conditions, and analytical pair data.

Metal Cleaning Bibliographical Abstracts, 1957 Supplement, American Society for Testing Materials Special Technical Publication 90-D, 44 pages, paper cover, Non-members $2.00; AES Members $1.80.

These abstracts are designed to make the published data on metal cleaning readily available. The publication has been made possible by the efforts of Jay C. Harris, Monsanto Chemical Co., in collecting, arranging and indexing the annotated references.

References are arranged by year, then by author or by journal if author is anonymous. References are numbered consecutively. In addition, the references are indexed by subject, author, specification and patent.

The book contains over 225 new references including coverage of cleaning by ultrasonic means, cleaning stainless steels, and titanium; cleaning semi-conductors such as germanium. It supplements Metal Cleaning Bibliographical Abstracts, STP 90-B, which covers the years 1842 to 1951; and the 1954 supplement, STP, 90-C, which covers the years 1952 through 1954. This 1957 supplement brings the references up to 1956.

Antigalling Coatings and Lubricants for Titanium. E. L. White, P. D. Miller, and R. S. Peoples, Titanium Metallurgical Laboratory, Battelle Memorial Institute. Feb. 1956. 54 pages. Order PB 121610 direct from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., $1.50.

Lubricants, with the possible exception of fluorocarbons, are not effective in lubricating and reducing galling type of wear of bare titanium and its alloys. However, wear performance satisfactory for many operations can be obtained by use of coatings of various kinds on titanium in addition to suitable lubricants. Wear resistance can be improved by oxide, nitride, and carbide case hardenings and coatings. Poor wear characteristics can be improved by metallic coatings of chromium, aluminum, copper, nickel, and other metals. Chemical conversion coatings such as fluoride-phosphate coatings, phosphate coatings, and anodized coatings, reduce wear and improve lubrication. Wear characteristics of commercial alloys are similar to the metal itself, and generally can be improved by the same techniques.

Protective Shot Peening of Propellers: Part 3—Fatigue and Distortion. R. F. Broderick, Lesselles and Associates, Inc., for Wright Air Development Center, U. S. Air Force. 109 pages. Order PB 131273 direct from Office of Technical Services Services, U. S. Department of Commerce, Washington 25, D. C., $2.75.

This report is the third of a series on tests which substantiated the effectiveness of shot peening as a means of protecting aircraft propeller blades against reduction of fatigue strength arising from service damage. Tests on SAE 4340 steel indicated that benefits increase with increasing hardness of steel. In light damage, for example, shot peening increased fatigue strengths up to 86 per cent. Optimum ratio of depth of compression to depth of damage was about five or greater. For heavy damage, shot peening raised fatigue strengths to 133 per cent, with optimum ratio of depth of compression to depth of damage about five or greater.

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INDUSTRY NEWS

Armour Research Has Record Year—Armour Research Foundation of Illinois Institute of Technology enjoyed one of the best years in its 21 years of service to industry and government during the 1956–57 fiscal year, according to Dr. Haldon A. Leedy, ARF director.

"A conscientious effort was made to upgrade the technical proficiency of the Foundation without sacrificing volume," he said. "How well this was accomplished is reflected in the results."

A record 734 research projects—more than ever before—were conducted during the year.

Dalic Opens Two Offices—Dalic Metachemical Ltd., Toronto, Canada, has announced the opening of two new offices in the United States. The Western representatives, Piddington & Associates Ltd., 3219 East Foothill Blvd., Pasadena, California, are headed by L. W. Piddington, and service California, Nevada, and Arizona. Ohio Metachemical Inc., 2742 Second Street, Cuyahoga Falls, Ohio, is the Midwestern office, handling sales and service for Ohio, Indiana, Kentucky and Tennessee. This firm has retained P. H. Brotzman, Ohio metallurgist, as administrative consultant.

These two firms, together with Marlane Development Co., New York and the company's main office in Toronto, are now able to supply Dalic selective area plating equipment and materials for any plant throughout the United States.

Michigan Chrome Enlarging Plant—Michigan Chrome and Chemical Co. announces the breaking of ground at the Grinnell Avenue plant in Detroit for a new 18,000 sq ft laboratory addition.

According to Robert J. Huber, president, the new quarters will provide laboratory facilities for both the plating and chemical divisions. Separate laboratories will be assigned to plating control, new products research, chemical products development and technical service. Facilities will also be provided for a plating pilot plant, devoted to research and development of new plating techniques and processes; and a chemical pilot plant, which will assist in the commercialization of new developments in chemical research. The new building will also include an instrument laboratory, library, light equipment room, and conference room.

It is scheduled for occupancy by March 1, 1958.

Blakeslee and Branson Combine—M. S. Blakeslee and Co., Chicago, builders of automatic industrial washers and degreasing machines, and Branson Ultrasonic Corp., Stamford, Conn., makers of ultrasonic equipment, have joined forces to design, sell, and service an advanced line of ultrasonic cleaning machines.

Ultrasonic washers and degreasers using Branson equipment will be available exclusively through Blakeslee. For applications not requiring cleaning machines, the ultrasonic equipment is available directly from Branson.

Carboline Occupying New Office and Laboratory—Carboline Company of St. Louis, Mo., manufacturers of corrosion resistant protective coatings and linings, announces the moving of their general office and research laboratory to a recently completed new building at 32 Hanley Industrial Center.

Almost triple the space of their old location, the new laboratory is modern in all respects. The area is divided into bays for individual group development work.

Among the innovations are an application research department with all the various types of industrial equipment now available for coating applications. With this variety of equipment, this department develops new techniques in both coating and lining work. Included are various types of hot spray, heavy body pump guns, airless spray equipment, and special high pressure spraying.

Richard O. Hull

Richard O. Hull, founder and president of the R. O. Hull & Co., Inc., was stricken suddenly with coronary thrombosis and succumbed at Lakewood (Ohio) Hospital Friday night, November 29. He was 52 years of age. Residence was at 19051 Inglewood Drive, Rocky River, Ohio.

One of the world's authorities on electroplating, Mr. Hull had more than 30 patents to his credit pertaining to the plating and testing of tin, copper, zinc, cadmium, and other metals—of which most continue in use today. His invention of the Hull Cell gained him world-wide recognition through its use as the standard control and evaluation method for plating baths.

Mr. Hull was born in Troy, N. Y. He led his class at the University of Colorado and graduated with special honors. While doing graduate work at George Washington University in Washington, he worked for the Bureau of Standards under Dr. William Blum. He became an authority

Architect's conception of the new laboratory of Michigan Chrome and Chemical Co.

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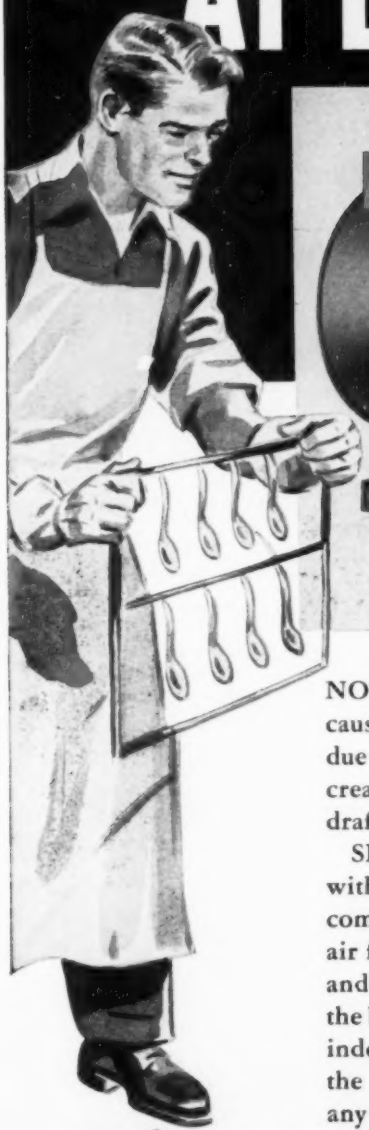

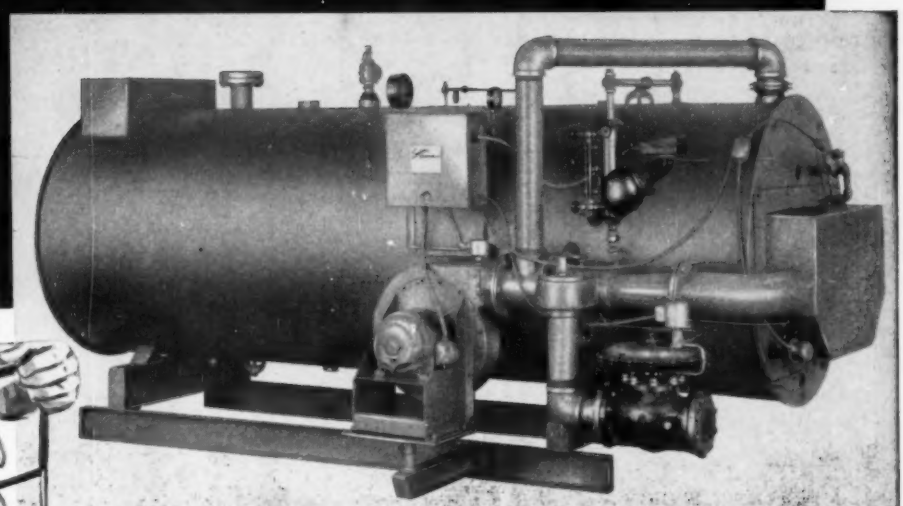

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A positive pressure blower supplies air under pressure which is mixed with the gas and passed to burners in the completely closed combustion chamber; to complete combustion, secondary air is fed into the closed chamber under positive pressure (many times greater than the vacuum in the building). By this method of securing positive complete combustion, burned gases are pushed through the boiler and FOUL FUMES ARE ELIMINATED.

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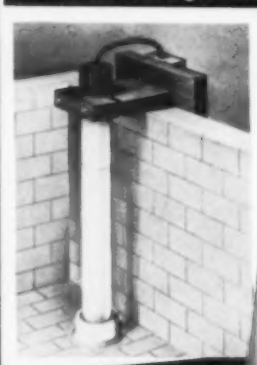

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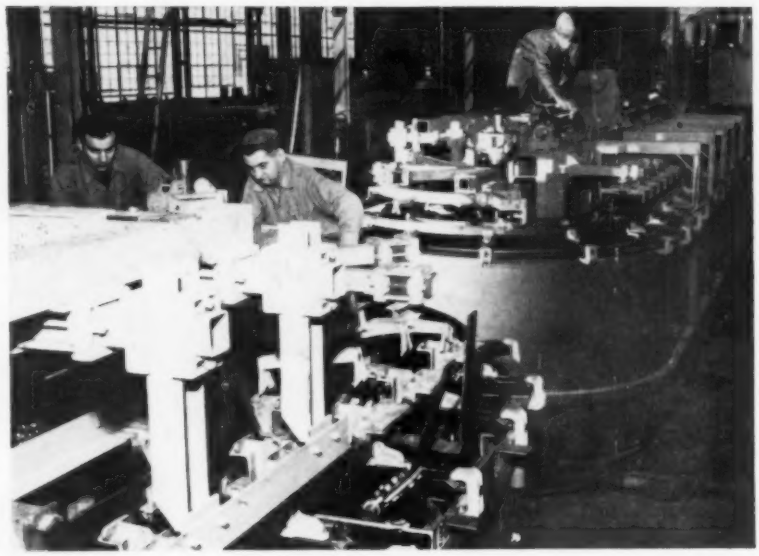

Finishing touches being applied to the automatic plating machine (background) which, with two others, and 38 rectifiers and 13 regulators, is part of an installation made at IBM's Processing Machines Division, Rochester, Minn., by the Equipment Division of Wagner Brothers Inc., Detroit.

RICHARD O. HULL

on the deposition of copper while with RCA Victor in Camden, N. J.

Mr. Hull joined E. I. duPont Co. in 1933 and became assistant research director of the Electrochemical Department before leaving to found his own firm in 1944.

In the past, Mr. Hull supported a number of philanthropic activities including the Engineering Development Fund for aid to students in the field of Chemical Engineering or for Chemical Research at the University of Colorado. He belonged to the American Electroplaters' Society, British Institute of Metal Finishing, Electrochemical Society, American Chemical Society, American Institute of Chemical Engineers, Alpha Chi Sigma and Tau Beta Pi, a national honorary engineering society.

Mr. Hull is survived by his wife, two sons, Richard Jr. and Harry F, a daughter, Mrs. Robert C. Platt; six grandchildren, his mother and a brother.

Ray Parker—Ray Parker, only recently appointed as Eastern Michigan Representative for American Buff Co., Chicago, died Sunday, October 13, following a heart attack. His untimely death closed a life brimming with activity and interest in both the metal finishing industry and leisure sports. A member of the American Electroplaters' Society. His business rise, starting with work on the wheel, took him up through shop supervision to specialization in stainless steel metal finishing and consulting engineer in this field. His sales ability turned him to selling metal finishing supplies, and, in 1956, to American Buff Co. He is survived by his wife and two children.

INDUSTRY NEWS BRIEFS

CHICAGO ELECTROPLATERS URGE TAX REDUCTION

Passage of eighy-five different United States Senate and House bills to amend the internal revenue code to help small business was urged Tuesday morning, Nov. 12, before the United States Senate Select Committee on Small Business meeting at the United States Courthouse in Chicago.

By reducing taxes on small businesses, the measures will improve the firms' competitive positions and thus stem the trend of big business gobbling up small enterprises through mergers, the Senate Committee was told.

Trade association of Chicago area electroplating shops, the Chicago Electro-Platers Institute, made the tax reduction plea. Members fall into the small business category, their shops averaging fewer than forty employes.

The Senate Committee was on a tour of American cities sampling local business opinion on small business problems.

Active on the electroplaters' committee were Harold W. Baker, Electro Galvanizing Co.; Chet J. Kennedy, American Buffing and Processing Co.; Herbert E. DeGrenier, Grand Plating Co.; Lawrence J. Hay, Plating Service Co.; Charles N. Jensen, Jensen Plating Works; and James P. Malooly, Western Rust-Proof Co.

NEW BEARING ALLOY OF RETICULAR ALUMINUM-TIN

The bringing into production of a new type of bearing alloy is announced jointly by the Tin Research Institute and the Glacier Metal Company, who have been working together for some years on its practical development.

The new bearing alloy contains about 20 per cent of tin, the remainder being aluminum hardened with from 1 per cent to 3 per cent of copper. The tin constituent has a structure which is reticular within the continuous aluminum matrix, i.e., the tin has a structure which is itself continuous without disturbing the continuity of the aluminum. Should metal to metal contact occur between a shaft and a bearing with this reticular structure there is an immediate supply of tin available at the surface to provide a thin soft layer of tin over the aluminum and thus inhibit surface breakdown.

The new alloy is said to combine the strength of a continuous aluminum phase with the tin-availability of a comparatively heavy and continuous tin structure. When supplied in the form of steel-backed bearings, it is claimed to provide a better balance between the opposing demands of high fatigue strength and low rates of wear than any other known plain bearing. It is further claimed unlike copper-lead bearings, it needs no lead-based overlay plating to keep shaft wear in check.

HIGHER TARIFFS ON LEAD AND ZINC?

Action taken by the Tariff Commission and the President on excessive lead-zinc imports may affect the future of the Reciprocal Trade Agreements Act. This opinion was expressed at the recent Annual Convention of the Northwest Mining Association in Spokane.

C. E. Schwab, chairman of the mining industry's Emergency Lead-Zinc Committee, Washington, D. C., said record imports of lead and zinc this year have forced the prices of these metals down to the point where only about 40 per cent of domestic ore production during the third quarter of 1957 was produced at a profit.

COPPER SULFATE IN OCTOBER 1957

All segments of the copper sulfate producing industry in the United States operated at reduced rates in October as compared with September. Production decreased 29 per cent in October and was less than shipments, which dropped 16 per cent; stocks on October 31 were 12 per cent less than those on September 30.

Barrel Nickel Plating

●

We live in a world of change. If we don't change we are left behind. Barrel nickel plating has changed in the last ten years. True Brite has been able to lead the way to high quality, high speed barrel nickel plating. Others can copy but True Brite can continue to provide the standard by which others are judged. Every plating installation differs in some respect so we don't try to give you a package that you have to follow. Clothing may be made of the same fabric but each suit has to be tailored to fit the individual. True Brite Barrel Nickel solutions are used to plate everything from straight pins to screwdrive blades and ash trays. With this variety some tailoring of the solution and conditions of operation is necessary. We put some of the variations in our regular bulletin but frequently have to supplement these to fit particular jobs. We think we've had more experience with barrel nickel plating than any other supplier. We invite your inquiry on your specific job and will try to recommend the tailoring that will fit your case.

●

True Brite still make what we fondly believe is the best nickel brightener for barrels. In spite of other claims we were the first to regularly ship nickel brightener in 4 gallon non returnable cartons having started seven years ago. If you aren't using our Barrel Nickel Brightener now just remember the best platers do.

TRUE BRITE CHEMICAL PRODUCTS CO.
98 FALLS AVENUE OAKVILLE, CONN.

USE READER SERVICE CARD; INDICATE A 142.

PATENT ABSTRACTS

(*Continued from page 66*)

No. 2,806,332, 9/17/57—Method of Making Cloth Buffs—John J. Lawler, assignor to Ajax Buff Co., Chicago, Ill.

Claim 1 states: "The method of manufacturing a buff comprising the steps of winding a length of cloth material on a mandrel to provide a tubularring of multi-ply fabric of circumference substantially the same as the desired outside circumference of a finished buff, stitching one edge of said tubular ring continuously to secure said plies together, and simultaneously pleating and stitching said edge to reduce said edge to a uniform desired internal circumference, and securing said edge of the buff ring to a buff hub."

7 claims, 6 figures.

No. 2,806,577, 9/17/57—Automatic Two-Way Transfer—M. Lang, assignor to Frederic B. Stevens, Inc., Detroit, Mich.

An automatic transfer between conveyors is described.

12 claims, 4 figures.

No. 2,807,349, 9/24/57—Transfer Mechanism—P. Hauck and W. Levering, assignors to Hanson-Van Winkle-Munning Co., Matawan, New Jersey.

This patent describes an automatic transfer mechanism between conveyors and/or material handling equipment.

11 claims, 8 figures.

No. 2,807,575, 9/24/57—Method of Electroplating Aluminum—C. Charlton and Nelson Murphey, assignors to Research Corp., New York.

Aluminum is deposited from a molten mixture of aluminum chloride 800 parts, sodium chloride 200 parts, vanadium pentoxide 1 part, at 180–185C. at 80 asf according to Example II. Claim 1 calls for 50–90 per cent aluminum chloride, 5–50 per cent NaCl, 0.05 to 1.0 per cent Va_2O_5 and a c.d. of 5–100 asf.

5 claims.

No. 2,807,576, 9/24/57—Bright Silver Plating—O. Kardos, assignor to Hanson-Van Winkle-Munning Co., Matawan, New Jersey.

A bright silver plating addition agent is described as a water soluble resin resulting from the reaction of CS_2, alkali and a ketone of the formula $R\ CH_2\ C(=O)\ CH_2\ R^1$ where R and R_1 are alkenyl, aryl and alkali metal carboxymethyl.

8 claims.

No. 2,807,584, 9/24/57—Material for Cleaning Silver—E. Rushton, Charlottesville, Va.

A polishing cloth for silver is made by impregnating a fabric with a non-ionic fatty acid alkylolamide mixed with an abrasive, (Whiting, chalk).

1 claim.

No. 2,807,585, 9/24/57—Inhibitor Acid—G. Gardner and A. Saukaitis, assignors to American Chemical Paint Co., Ambler, Pa.

An inhibitor effective in acid solutions can be made by heating at 60–150C. for 5 min to 24 hr a substituted 4 hydroxy piperidine.

2 claims.

No. 2,609,127, 10/8/57—Surface Treatment of Metals—T. Gibson, assignor to Metal Gas Co., Ltd., Glasgow, Scotland.

Resistance to oxidation is increased by chromizing alloys of alloys of Al, Cr, Co, Cu, Fe, Mn, Mo, Ni, Nb, Si, Ti, W, Ta, Va, Zr, and B followed by a coating of aluminum and heating in an oxidizing atmosphere.

4 claims.

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VAPOR-PLATING

The Formation of Metallic and Refractory Coatings by Vapor Deposition

By C. F. POWELL, I. E. CAMPBELL, and B. W. GONSER, all at the Battelle Memorial Institute.

1955. 158 pages. Illus. $5.50.

AES Members $4.60

This is the first single source of reference for data and information on these processes. Provides a critical and authoritative review of the applications and techniques of vapor deposition of metals and non-metals.

The versatility of vapor-plating processes is stressed by the authors in an effort to stimulate the use of these processes as a flexible tool in many fields of technology. Sponsored by THE ELECTROCHEMICAL SOCIETY.

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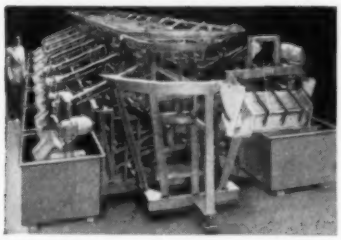


E—101. Automatic Barrel Plater—More uniform distribution of electroplating deposit combined with increased output at reduced cost are features of a new automatic barrel plating machine announced by Belke Manufacturing Co.

To provide maximum flexibility, the machine uses horizontal plating cylinders with hanger mounted motor drive. Cylinders are attached by bolting the hanger bridge to the hanger arm of the machine. They are easily changed and different types can be used. Practically any cylinder suitable for full cycle operation can be converted for use with the Belke Automatic. Machines are available with double oscillating or conventional cylinders.

The standard machine has 18 cylinder stations, including 5 plating tank positions. With a 20 min. plating period this machine turns out a completed cylinder every four minutes. Machines with practically any number of cylinder positions can be built to order.

Only 8′2″ at the highest point, the new machine can be installed under a 9′ ceiling.

E—102. Barrel Chrome Plater—The Dawson Corp. makes available the standard model Riedel barrel chrome plater for processing a variety of parts of various shapes, sizes and weights. This is so because of its unique design which allows for adjustment of the angle of the barrel, a choice of different size mesh plating baskets and an adjustable anode. The position of the anode in relation to the work load can be changed to suit the size of the load and the size and shape of material being processed. Loads may vary from 5 to 10 lb depending on the size, shape and weight of the pieces.

A 750 to 1000 amp rectifier is used with the standard model. A 50 gal solution storage tank is water jacketed and equipped with three 2000 Watt immersion heaters. ➤

E—103. Ultrasonic Liquid Detergent—A new ultrasonic liquid detergent for accelerating the cleaning of a wide variety of such difficult-to-clean objects as precision parts, surgical instruments, ball bearings and clock type mechanisms has just been introduced by Acoustica Associates, Inc.

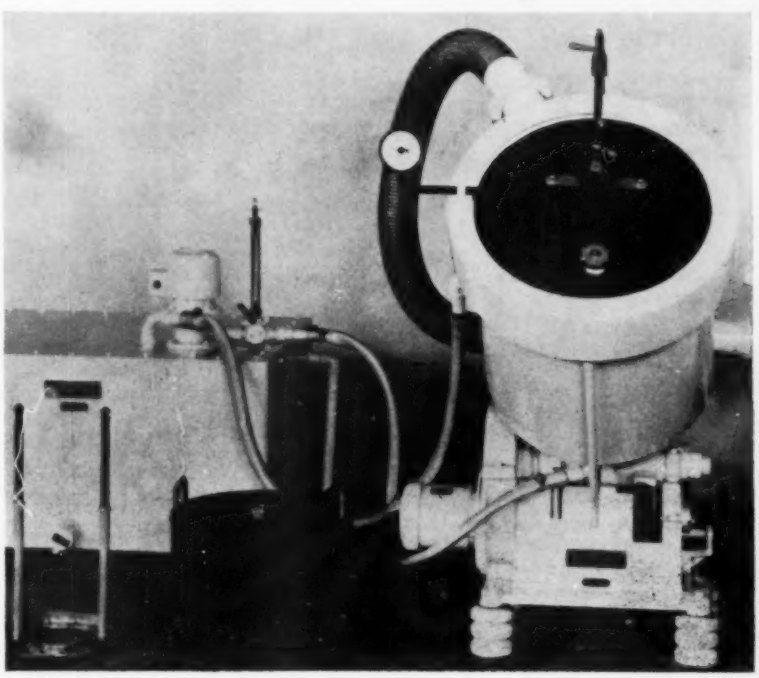
A low-cost water based detergent suitable for use with all types of ultrasonic cleaning systems, it is claimed to acoustically condition the cleaning solutions to provide maximum dirt removing action. The new detergent, designated Ultrasonic Cleaner No. 715, ordinarily is used in proportions of several ounces per gallon of warm water, the exact concentration depending upon the degree of soil. When used in conjunction with an ultrasonic cleaner of any manufacture, the detergent is said to accelerate the removal of soils in a fraction of the time required with ordinary household detergent solutions presently in use.

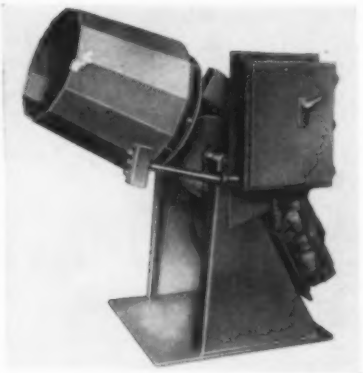
E—104. High Density Coatings of Molybdenum—A metallurgical technique, now under refinement at Vitro Laboratories, a division of Vitro Corp. of America, under an Atomic Energy Commission contract, opens the door to the production of uniform, high density molybdenum coatings.

The process is based primarily on electrophoretic deposition. Until recently, electrophoresis was limited in application chiefly to coatings subject to little or no stress, such as the deposition of latex in the manufacture of rubber gloves and the coatings of special oxides on thermionic tube elements. Today, the electrophoretic technique is being refined by Vitro's West Orange Laboratory for the development of a wide variety of coatings.

E—105. Regenerating Process—A process for regenerating spent ferric chloride etch, such as used for etching copper, as in the making of printed circuits, half-tone plates, and textile printing rolls, has been announced by Graham, Savage and Associates, Inc. The process was stated to greatly reduce the waste treatment load and effect a substantial saving in chemical use and treatment cost.

It was also claimed that high purity copper is recovered in powder form, while the etch is regenerated at a cost which makes the over-all operation profitable. There is said to be no need to purchase fresh ferric chloride; the cost of the installation is recovered quickly, and the problem of waste treatment is minimized.





E—106. Barrel Finishing Machines—A new series of barrel finishing machines by The Baird Machine Co. under the trade name Poliaction, features complete redesign of pedestals, with new drive and tilting mechanism options to meet production-line requirements.

Machines are available in two sizes: No. 1 for barrels 13 to 22 in., and No. 2 for barrels 22 to 36 in. They may be ordered equipped with either push-button or manual-hydraulic barrel control, and with either vari-speed motor or vari-sheave drive. 'Poliaction' machines may be used with standard barrels.

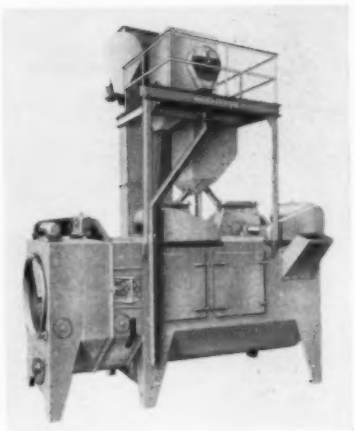
E—107. Conversion Coating—A new conversion coating for zinc plating which produces a bright, clear finish without leaching in processes where maximum corrosion resistance is secondary to bright appearance is reported by Wagner Brothers Inc.

According to the company, the resultant finish provided by the coating has a minimum of iridescence, and can be applied over both barrel and rack-plated parts.

The formulation of the coating, called Iso-Lok ZDP, is such as to lend itself to low-cost operations. In making up a typical bath, the basic product, in form of a powder, is mixed with nitric acid (3 lb of powder to 1½ gal of acid) for each 100 gal of working solution.

During the coating operation, the bath is operated between 80 to 100 F, the parts being immersed from 5 to 25 sec, with slight agitation.

E—108. Bright Brass Process—A new bright brass process suitable for direct plating of wire goods and hardware has been announced by Yorktowne Special Products. Called Sol-Brite, the process features inexpensive makeup, good leveling and current densities to 300 amp/sq ft. Used with less brightener a fast easily buffed plate is produced. Conventional brass baths may be converted.



E—109. Continuous Tumblasts—The 26 in. continuous tumblast with end discharge is the latest addition to the line of continuous tumbling-type blast cleaning machines manufactured by the Wheelabrator Corp.

It is designed to handle a continuous flow of miscellaneous work at a high rate of production. The blast cleaning is completely automatic and continuous. Work enters the machine from one end directly into the cleaning chamber; it then passes down an inclined chute into the discharge

For Every Plating and Metal Finishing Plant Requiring Waste Analysis Methods

Procedures for Analyzing Metal Finishing Wastes

Comprehensive manual of 102 pages containing precautions to be observed in collecting samples of metal finishing wastes, fundamentals of sampling techniques, the determination of cyanide, cyanate, cadmium, chromium, copper, iron, lead, manganese, nickel, zinc, ammonia, chloride, chlorine, nitrate-nitrite nitrogen, ortho-phosphate, and sulfate—and a section on pH and residue.

This valuable publication, developed from American Electroplaters' Society Research Project at Lehigh University and expanded and prepared by the Metal Finishing Industry Action Committee of the Ohio River Valley Sanitation Commission is available at

Only $1.00 prepaid with order.

American Electroplaters' Society, Inc.
445 Broad Street
Newark 2, N. J.

drum and is dropped from there into a tote box or conveyor.

The blast chamber is a full length, full diameter, endless apron conveyor. Because the blast unit is located above the full diameter of the tumbling mill, the chamber is clear and unobstructed.

The combination of tumbling and longitudinal travel is claimed to uniformly expose all surfaces of every part to the abrasive blast of the overhead Wheelabrator unit or units.

★

E—110. Zinc Bath Purifier—Allied Research Products, Inc. has announced the introduction of ARP No. 12 zinc purifier for preventing the accumulation of harmful impurities in zinc plating baths. By purifying solutions of heavy metallic elements, ARP No. 12 is said to considerably reduce the amounts of plating brighteners necessary to provide a bright plate.

It is a concentrated liquid which, when diluted with water and added to the plating bath, is claimed to precipitate heavy metallic impurities (including lead and cadmium). It is also claimed to remove carbonates at about the same rate at which they are formed. Proper operating concentrations of ARP No. 12 are determined by use of sulfide test papers.

The solution is packaged in 5-gal pails and 30 and 55-gal steel drums.

★

E—111. Float-Thermostatic Steam Trap—Improved, simplified, construction increases the accessibility of Sarco Co.'s Float-Thermostatic steam trap, type FT greatly facilitating inspection, maintenance, and installation. The entire operating element of the new FT trap is one unit, which can be removed without disturbing inlet and outlet connection to the semi-steel trap body, suitable for 125 psi steam pressure. Operating elements consist of stainless steel valve mechanism, copper float, and bronze thermostatic air vent.

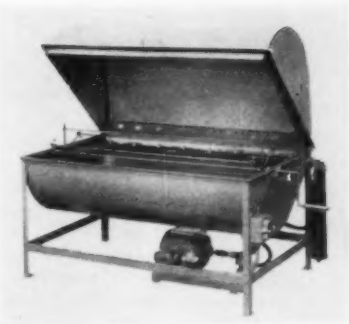
Valve is designed to provide condensate seal and prevent loss of steam. It discharges condensate at steam temperature continuously and without shock. Separate air vent, requiring no adjustment when pressure changes, removes all air and incondensable gases, allowing no steam to escape.

★

E—112. Flowcoating System—A new method for applying air-drying or baking synthetic finishes or lacquers at low cost to small metal, wood and plastic parts is being offered by William A. Finkbeiner. The method utilizes a Model 122 flowcoater with rotating reels designed to hold a variety of small parts, and a Model 814 rotator to which the reels are transferred after coating.

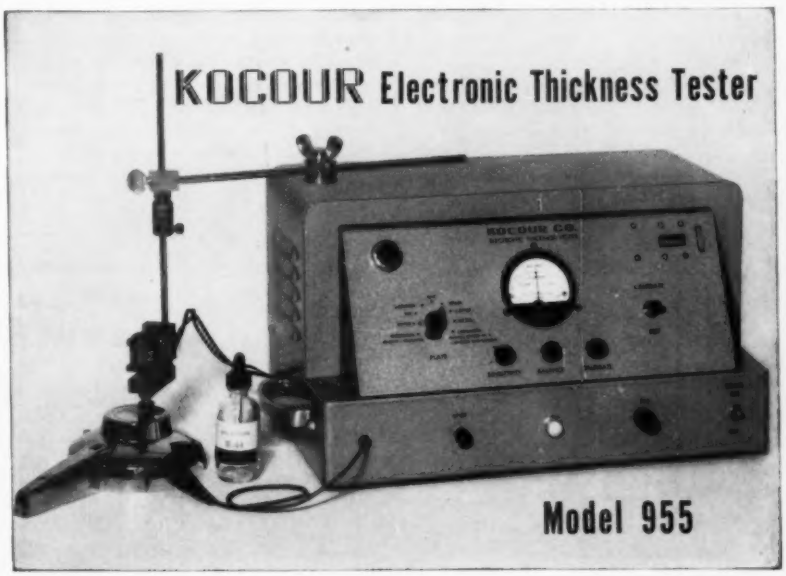
The same reel handles the parts through all the stages of the finishing cycle. By making use of an appropriate number of reels, the process can be operated on a continuous basis.

Model 122 requires three gallons of finishing material. This material is pumped from the bottom of the tank through a 25 micron filter and into a horizontal manifold where it cascades from a series of special bronze nozzles onto the reel-mounted parts as the reel is rotated slowly by hand. Approximately one minute in the closed flowcoater provides a solvent-vapor run-out of excess lacquer which drains back to the reservoir for re-use.



After flowcoating, the reel and parts are transferred to the Model 814 Rotator, which accommodates eight reels at a time. Revolving the reels on the rotator for about 15 minutes allows the coating to set with an even flow-out of excess material.

KOCOUR Electronic Thickness Tester



Here's a Positive way to solve plating thickness problems!

The accuracy of a thickness test can be no better than the accuracy of the method used. The Kocour Electronic Thickness Tester Model 955 gives you direct readings with an accuracy of 90–95%. A Calibration feature used in conjunction with accurately prepared Kocour Thickness Standards provides a check on this accuracy. In addition, a quick calibration adjustment automatically corrects slightly high or low readings. Here is a positive method of thickness testing. A new basis on which both buyer and seller of plating can rely. Human error is virtually eliminated. Operation is quick, simple and automatic. Results are reproducible.

Model 955 may be the answer to your plating thickness problems . . . get full information today.

Ask for a demonstration or 15-day Free Trial!

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L—113. Cleaner and Filter Powder—An effective non-etch soak cleaner originally designed for aluminum but also suitable for brass, copper, zinc, lead and ferrous metals is fully described in Technical Data Sheet No. 45, a two-page usage and instruction sheet prepared by MacDermid Inc. Named Metex TS-40A, this cleaner is also being used for removing tars, inks, pitch and drawing compounds, as well as normal shop soils.

A filter powder that is compatible with brighteners and never causes roughness in copper, all other cyanide-type and bright nickel solutions, is described in MacDermid's Technical Data Sheet No. 28, a three-page usage and instruction sheet. Called Metex Filter Powder, the product is an insoluble cellulose fiber which will not settle on the work or anodes when current is applied.

L—114. Activated Carbon—A 12-page booklet entitled "Powdered Activated Nuchar for Purification and Reclamation," has just been published by Industrial Chemical Sales Division of West Virginia Pulp and Paper Co.

The booklet offers helpful hints on the use of Nuchar for the removal of impurities and objectionable odors and on its ability to absorb desirable materials which are to be recovered.

Nuchar has been found to have many uses in a wide range of industries and products, including electroplating.

L—115. Mechanical Plating Barrel—A catalogue covering all sizes and types from porto-platers to full automatics is available from Belke Mfg. Co. It includes double oscillating, variable speed, belt and gear driven cylinders of Plexiglas, Melamine, Tempron hard rubber, Transite, Monel, etc. Nickel plating barrel, auto rinse tanks, transfer and storage units, ventilation hoods and ductwork are also covered.

L—116. Plastic Valve—A four-page booklet containing essential data about its new Flex-Plug all-plastic gate valve has just been prepared by the Vanton Pump & Equipment Corp. It includes simplified drawings showing the advantages of the straight-through no-pressure drop flow feature and the close throttling control designed into the valve and a cut-away drawing of the all-plastic valve picturing the resilient flexible cap designed to meet varied corrosive, slurry and vacuum services.

A graph made from laboratory tests by Vanton illustrates the applicational flexibility of the valve.

L—117. Germanium Rectifiers—GEA-5773C, a six-page General Electric bulletin, tells how to select and apply fan-cooled and blower-cooled germanium rectifiers. Tables, charts, line drawings, and photographs are included to tell the story of parallel and series operation, to indicate operating characteristics, to give dimensions, ratings and model numbers, and to offer information on special features of these component rectifiers.

L—118. Fume Washer—A plastic fume washer with cyclone action said to be completely free of harmful effects from corrosive vapors and acids is described in detail in a four-page illustrated folder just issued by Line-O-Coat Industrial Equipment Co.

Fabricated from fibreglass reinforced plastic with superior chemical properties, the fume washer is specially designed to handle acid-laden or harmful vapors and plating fumes in all types of industries.

The brochure contains in-use photos of the unit, plus a cross-section drawing showing pertinent information.

L—119. Hard Anodizing—A new 20-page brochure entitled, "Precision Finishes

For Metal Finishers!
Pressure Moulded NEOPRENE "CAPLUGS"
as a Cap
as a Plug
7 STANDARD SIZES

	A	B	C	D	E	F	G
TO PLUG HOLE SIZE	1/8-3/16	3/16-1/4	1/4-5/16	5/16-1/2	1/2-5/8	9/16-11/16	5/8-3/4
TO CAP STUD SIZE	3/32-5/32	5/32-3/16	3/16-1/4	1/4-5/16	5/16-3/8	3/8-7/16	5/16-1/2

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on Metals" is offered by Anachrome Corp., an affiliate company of Anadite, Inc. Particular emphasis is placed on the Hardas Process method of hard anodizing. The brochure is the first complete illustrated brochure ever offered on the process.

L—120. Protective Coating—A new technical bulletin just released presents the features, properties and characteristics of Mono-Seal, a plastic type protective coating recently developed by Mono-Seal Products.

The bulletin offers complete data on application, drying times, coverage and surface preparation. A special "value analysis" section provides a guide for selection of coating materials by analyzing coverage, surface-life, surface preparation, drying time, loss of operating time and refinishing cycles.

L—121. Filtration Equipment—Commercial Filters Corp. has published a new catalog on Fulflo and CFC filtration equipment for micronic clarification of all types of fluids including electroplating solutions. Filters are designed for high or low rates and pressures. Container metals and elements allow for handling solutions of varying pH, temperature and viscosity.

The catalog describes and illustrates each type of Fulflo filter which employs honeycomb filter tubes in single or multi-tube arrangement.

The CFC filters described include Honan-Crane and Michiana models, models for surface full-flow filtration and for by-pass applications.

L—122. Plating Barrel Data Sheet—Substantial savings provided by a newly designed Mercil type belt-driven barrel plating cylinder are explained in a two-color data sheet now offered by the Hanson-Van Winkle-Munning Co.

The bulletin tells how a newly designed belt drive allows total submersion of the barrel in all plating solutions by eliminating a series of gears. The total submersion feature cuts plating time, offering corrosive substance savings. Other benefits discussed include low initial cost and inexpensive replacement of the cogged V-belt, which is a stock item purchasable anywhere.

Tables list capacities and dimensions of tanks and apparatus as well as four standard barrel sizes.

L—123. Polyethylene—A special laboratory report on the adhesion of polyethylene to metals, highlights the current issue of the Plastics Weldor and Fabricator, the external house organ of the American Agile Corporation.

Also included are two case studies: the first details the application of polye hylene tanks to reduce maintenance time and costs during anodizing and plating operations; the second illustrates and describes the use of a polyethylene fume exhaust system to slash corrosion costs in an industrial laboratory.

L—124. Acid Gold Plating Process—The perfection of a new acid-type (*p*H 3.5 to 4.5) gold plating process, developed specifically for plating printed circuits, has been announced by Sel-Rex Corporation. According to the announcement, the processes' electrolyte is mildly acid so that neither the laminate nor the adhesive at the inter-face of printed circuit boards are affected during plating.

Among other advantages claimed for Sel-Rex's new acid gold plating process are: operates at room temperature—no hot solutions to damage even the less expensive paper or micarta printed circuit baseboards; approximately 75 per cent greater resistance to abrasive-wear than conventional gold plate; smooth, fine-grained, uniformly distributed bright gold plate regardless of thickness requirements; easy to prepare, simple to maintain and control solution.

It is reported that the new process eliminates the need for a conventional "gold strike" avoiding damage to printed circuit board photo resist by exposure to warm cyanide solutions.

A technical paper describing the new process, bath preparation and control, equipment needed and other topics of interest to printed circuit manufacturers, is available.

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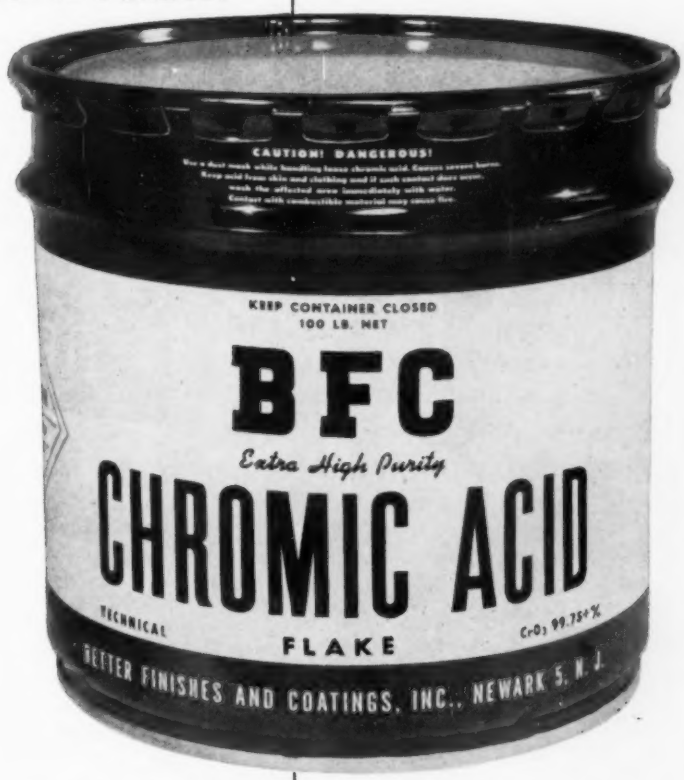

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ARTICLE REFERENCES

By
WILLIAM TUCKER
Eastman Kodak
Rochester, N.Y.

Most of the articles listed here may be obtained by writing to the publications in which the articles were published. Addresses are given at the end of the references for the reader's convenience.

Photostat or microfilm copies of articles in available magazines may be obtained from: Library of Congress, Washington, D. C.; New York Public Library, New York; Engineering Societies' Library, New York, at prevailing rates. In other cases, consult Wilson's Union List of Serials at your nearest public library for other sources of these articles.

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S. C. Shome.
Indian Chemical Society, Journal, *34*, May 1957, pp. 399–403.
"Chromium-rich alloys of molybdenum have been plated from solution prepared by dissolving molybdic acid in the standard chromium plating solution. The dull deposits become bright on polishing. The highest amount of molybdenum achieved was 1.7 per cent. Plating compositions, temperatures and current density conditions are tabulated."

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L. D. McGraw, Battelle Memorial Institute. (Bureau of Aeronautics).
U.S. Office of Technical Services, PB 111911, December 1952, 82 pp.

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a. *THICK OXIDE FILMS ON ALUMINUM ALLOYS.*
J. M. Kape.
Metal Industry, *91*, August 23, 1957, pp. 148–150 and *91*, August 30, 1957, pp. 171–172.

3. CHROMIUM

a. *CHROMIUM ELECTROPLATES.*
Materials in Design Engineering, *46*, No. 3, September 1957, pp. 151–153.

4. CONTROL

a. *EFFECTIVE CURRENT DENSITY.*
J. B. Mohler.
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5. CORROSION—Theoretical

a. *FUNDAMENTALS OF ELECTRODE PROCESSES IN CORROSION.*
Milton Stern.
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6 DISPOSAL

a. *SCIENCE FOR ELECTROPLATERS. ACIDIFICATION OF CYANIDE WASTE.*
L. Serota
Metal Finishing, *55*, No. 11, November 1957, pp. 72–75.

7. EDUCATIONAL

a. *ELECTROCHEMISTRY AND THE PLATER.*
Fred G. Brune.
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8. MISCELLANEOUS

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U.S. Offices of Technical Services, PB 131062, April 1957, 53 pp.

9. NON-CONDUCTORS

a. *PRACTICAL METALIZING OF TECHNICAL CERAMICS.*
Raymond C. Steffey.
Metal Finishing, *55*, No. 11, pp. 56–61.

10. ORGANICS

a. *SCIENCE FOR THE COATINGS*

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TECHNOLOGIST. PART VIII. GREEN PIGMENTS.
E. S. Beck.
Metal Finishing, *55*, No. 11, November 1957, pp. 50–55.

b. *WHICH ORGANIC COATING?*
Howard R. Rothenberg.
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c. *PLASTISOL COATING OF PLATING RACKS AND TANKS. A JOB FOR SPECIALISTS.*
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d. *METHODS OF ELECTROSTATIC COATING.*
John Sedlacsik Jr.
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e. *COLOR MATCHING IN MASS PRODUCTION.*
Warren Beach.
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11. THEORY

a. *ELECTROCHEMICAL POLARIZATION. III. FURTHER ASPECTS OF THE SHAPE OF POLARIZATION CURVES.*
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a. *CHEMICAL POLISHING OF TITANIUM ALLOYS.*
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"A study of the chemical polishing of titanium alloys in H_2SO_4 shows that best results are obtained when the acid is boiling, the concentration is 80–90 per cent and the polishing time is 10–30 min. The alloys applicable are Ti-Cr-Mo, Ti-Ni, Ti-Cr, Ti-Ag, Ti-Mn, Ti-Fe, Ti-Mo, Ti-Cu, Ti-Co and Ti-Mo-Al."

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LAST CALL

FOR ORDERS FOR LAST YEAR'S

"TECHNICAL PROCEEDINGS"

As announced on a previous page of this PLATING issue, the 1957 Edition of the book of the American Electroplaters' Society (AES) titled TECHNICAL PROCEEDINGS has made its appearance and copies of it are enroute to AES members globally. Extra copies remaining after member distribution are being offered to non-members for purchase at prices and terms stated on that page.

Less than a hundred copies of the 1956 Edition of that book are also available for order by non-members on a *first-come first served basis so long as that limited supply lasts.* Domestic price is $12.50 per copy. On orders from outside of the United States' continental limits, the cost is $15 per copy. Postage is included in purchase price. *All orders must be accompanied by full payment to obviate unnecessary bookkeeping expense.*

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PERSONALS

R. MacKercher

A. M. Callis

Rex MacKercher has been appointed special representative on product application by Northwest Chemical Co. of Detroit.

Mr. MacKercher will work closely with the firm's customers in supplying information on products and methods developed in Northwest Chemical's laboratories. In this assignment he will supplement the sales force.

In addition to a degree in chemical engineering, Mr. MacKercher has extensive experience in the field of industrial cleaning and metal finishing. His background includes technical sales, production and development experience with some of the country's largest chemical firms.

He is a member of the American Electroplaters' Society and American Chemical Society.

Aubrey M. Callis has been appointed general sales manager of American Smelting and Refining Co. replacing **Edgar L. Newhouse III.** An ASARCO employe for 29 years, Mr. Callis is a native of Mathews, Va. He joined the company's Federated Metals Division as a clerk in Seattle, Wash., and progressed through the sales departments in the West, serving in Idaho, Montana, Oregon and California. After several managerial posts in Federated plants, Mr. Callis was placed in charge of the general sales department when it was created in 1948. With the Korean War, he was asked to take over the multi-million dollar Federated plant at Newark, N. J., in order to bring this unit into efficient production.

Mr. Newhouse, who was born in Salt Lake City, has been named Washington, D. C. representative of American Smelting and Refining Co. He joined ASARCO in 1938 as assistant export manager in New York. In 1952, Mr. Newhouse became sales coordinator, and was made general sales manager in 1954.

John L. Griffith will become sales manager of Federated's Eastern Division. Mr. Griffith has been sales manager of the Pittsburgh unit. He joined ASARCO in 1930 as a secretary, and served in the sales department, later going into the Lead Products Division operation. He joined the Federated Division in 1946, and was transferred to Pittsburgh in 1952.

E. J. Baker, manager of the Rochester, N. Y., Federated Sales Office, will replace Robert A. Colton as assistant sales manager of the Eastern Division. Mr. Baker has been with the company since 1935, when he started as a clerk in the mail room. He joined the Federated sales several years later, and served in various Eastern territories. He has managed the Rochester office since 1943.

J. L. Kammermeyer will become general sales manager of the new Central aluminum department, leaving his post as manager of the Houston Plant. Mr. Kammermeyer has spent most of his ASARCO career in his native St. Louis, starting with the Federated plant there as a chemical assistant in 1929. He went into the sales department, serving for a time as manager of the Milwaukee sales office. He returned to St. Louis as plant manager in 1952, and remained there until 1956 when he was named manager at Houston. His new post will return him to St. Louis.

R. A. Colton will replace Mr. Kammermeyer as manager at Houston. Mr. Colton came to ASARCO in 1946, following three years at the Naval Research Laboratory in Washington, D. C. He was named assistant sales manager in 1954.

Thomas D. McGuire has been named to the Chem-o-sol sales division, Chemical Products Corp. of East Providence, R. I. A graduate of the University of Michigan, he will represent the firm in upper New York State and surrounding territor es.

Mordy M. Rhodes has been appointed a sales engineer by Branson Ultrasonic Corp. for the midwestern area. Located at 5207 N. Harding Avenue, Chicago 25, Ill., Mr. Rhodes' office will cover Northern Illinois, Northern Indiana and all of Iowa, Minnesota, and Wisconsin. Branson's plant is at Stamford, Conn.

An electrical engineering graduate from the Illinois Institute of Technology, Mr. Rhodes has spent his last six years as a midwest instrument representative, specializing in ultrasonics since 1954. He is a member of the Society for Nondestructive Testing and the AES.

G. Henriksen

F. W. Donovan

Frank W. Donovan has been named to the board of directors of Hanson-Van Winkle-Munning Co.

Mr. Donovan is a partner of the law firm McClintock, Fulton, Donovan & Waterman in Detroit. He is president of Detroit Grand Opera Association and a director of Cleveland Terminal Properties, Inc., Browning Lines, Inc., Thunder Bay Manufacturing Co. and Soss Manufacturing Co.

Gerald M. Henriksen has been named a director of engineering of Acoustica Associates, Inc., Mineola, Long Island.

Mr. Henriksen recently resigned as director, research and engineering, Turbo Division of American Machine and Foundry Co. Prior to his AMF position, Mr. Henriksen was associated with Marquardt Aircraft Co., the Ames Laboratory of the Atomic Energy Commission and the Automatic Washer Co. At Acoustica, he will supervise the company's engineering activities in the Atlas Intercontinental Ballistic Missile Program and direct the engineering of new developments in the fields of ultrasonic cleaning and processing.

Bob Hulland is newly appointed as sales and service engineer for American Buff Co. in the Syracuse, N. Y., area. After four years' active duty with the Marine Corps, he entered the die-casting industry. After serving as journeyman tool and die maker, he spent two years as chief inspector with Precision Casting Co., Chicago. Since 1954 he has served as plant superintendent for Univex Die Cast and Engineering Co. of Dearborn, Mich.

James W. Hull has been elected vice president of the Reynolds Chemical Products Division of Stubnutz-Green Corp.

General Manager at Reynolds Chemical since 1955, Mr. Hull serves as administrative director for the Ann Arbor firm, directing research, production and sales.

He came to Reynolds as plant manager and technical director in 1953. He had previously served as technical director for the Flexible Tubing Corp., Guilford, Conn.; plant manager of the Perry Manufacturing Co., Moslan, Ohio; and as technical director, Edmont Mfg. Co., Coshocton, Ohio.

J. W. Hull

A. Neeme

Al Neeme has been named West Coast sales representative for Michigan Chrome and Chemical Co. He served for a number of years as sales engineer in the plating division of Michigan Chrome and Chemical and for two years was assistant manager of the coating division. Mr. Neeme has established headquarters in the Los Angeles area.

Donald R. Dutton, formerly a district sales manager for a large manufacturing firm, has been appointed technical service representative for Oakite Products at Lansing, Michigan. **George D. Findlay III,** is the new Oakite representative in Vermont.

Both representatives recently completed an intensive eight-week training program at Oakite's New York laboratories and in the field.

Joseph L. Montmarquet

Joseph L. Montmarquet, export manager of Commercial Filters Corp., died on Nov. 7 after a brief illness. Although his headquarters were in Ridgefield, New Jersey, he traveled extensively and had an acquaintanceship throughout the world.

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BRANCH NEWS

Total AES Branches U. S., Canada, Australia, January 1, 1958—57.

BRITISH COLUMBIA

Permanent Meeting Place Chosen; Mungenast is Speaker

The Nov. 18, 1957 meeting of British Columbia Branch was held at the White Spot, 25th & Cambie, Vancover. Fifteen members and guests were present.

G. Patterson moved and **N. McLeod** seconded the motion that the White Spot be our permanent venue for dinner meetings.

Notice was given of the librarian's proposal to poll all members as to their requirements of AES Research Reports.

John VanGolen suggested we obtain copies of the ASTM bulletins covering electroplating.

J. Lee advised that the December meeting would take the form of a tour of the B.C. Research Council building in the University area followed by refreshments at the Dolphin restaurant; wives were to be invited.

A letter was read from **A. Weisberg** of Technic Inc. advising he will speak to us on January 15 on the subject of "Precious Metal Electroplating Metallurgy."

W. Kellerman inquired about regional meetings with Seattle and Portland and the secretary stated that due to lack of response this had been postponed until spring.

Mr. Kellerman also reported on the progress of the night school course and obtained permission to order 15 Plating Guidebooks for distribution to the students.

J. Lee introduced the speaker of the evening, **John Mungenast** of General Electric. Mr. Mungenast showed wide-screen slides of various aspects of germanium and silicon rectifier development accompanied by a commentary of their problems, which was followed by a question and answer period during which the variety of inquiries proved how interesting the speaker's topic and talk had been.

J. Lee
Secretary

CAPITOL DISTRICT

Meet with Corrosion Engineers

A joint meeting of the American Society of Corrosion Engineers and the Capitol District Branch of the AES was held at the Hot Shoppe in Albany on Nov. 4.

After dinner President **Robert Wolf** introduced the speaker, **Michael J. Placitella** of Turco Products Co., who talked on "Phosphate Coatings" and showed a movie on aluminum conversion coatings. After Mr. Placitella had finished there was a very enlightening question and answer period in which many members participated.

After the question and answer period, the corrosion engineers left and the business meeting of the Branch was held.

Merle Shaw of the Diamond Alkali Co. made a motion that when a member signs up for a dinner, or any other activity which entails a financial outlay, pertaining to AES activities, he be obliged to pay for said reservation whether he attends or not. This motion was put forth because of the problems which are encountered when reservations are made and not kept. The motion was seconded and unanimously adopted.

Another problem was whether we would be able to hold a Christmas party this year. This was precipitated by the small number of reservations which had been turned in. **Frederick Infield** made a motion that if reservations for at least 35 couples were not turned in by November 9 the Christmas party would be cancelled. This motion was seconded and unanimously adopted.

Due to the holiday season, it was decided there would be no December meeting.

President **Wolf** instructed the secretary to purchase two copies of the Branch Officer's Manual.

William R. Allison
Secretary

CENTRAL MICHIGAN

Harger Speaks on Chromate Treatment

Central Michigan Branch met at the Hotel Hayes in Jackson, Michigan on Tuesday evening, Nov. 5, 1957. It was a combined dinner meeting and educational session. Twenty-eight members and guests attended.

Speaker for the educational meeting was **Stewart J. Harger,** assistant chief process engineer of the A. C. Sparkplug Division of General Motors Corporation. Mr. Harger spoke on "Protective Chromate Treatment on Zinc Plate and Zinc Base Die Castings." A number of slides were shown to illustrate many of the points of his talk. A question and answer period followed.

Two applications for membership were approved.

Homer E. Welch
Third Vice President and Publicity Chairman

CINCINNATI

Convention Committee Reports; Sanborn Discusses Nickel Plating

The meeting was called to order on Nov. 26, 1957 by President **W. Wilson Loveless** with 48 members and guests present.

One application of membership wa approved.

William A. Hopkins, a recent transferee from the Newark Branch, was introduced.

A report from the Convention Committee was given. The committee has established a program and submitted a budget to the National Society for approval.

Charles Sanborn, of the International Nickel Co., was the speaker for the evening. Before his dissertation Mr. Sanborn presented a very interesting movie on the "Mining of Nickel". The film pointed out the different methods of mining nickel and also the terrific amount of work involved in establishing a mine. After the movie Mr. Sanborn entered into a discussion on "Industrial Nickel Plating." It was brought out that there are nickel solutions available to produce varied physical properties of the final plate, but that in most cases very close chemical and operating controls are necessary. After a question and answer period the group adjourned to the social hour sponsored by the Harshaw Chemical Co., **Russ Waters** and **Lee Howald** hosts.

Past President **Ed Roof** won the door prize.

D. L. Kaplan
Secretary

DAYTON

Smith Speaks on Precious Metals

The regular meeting was held at the Hotel Biltmore, Nov. 20, 1957 with 38 members and guests present.

Two new members were elected.

The speaker for the evening was **Frank K. Smith,** of Technic, Inc., Providence, R. I., and his topic was "Precious Metal Plating Metallurgy."

Refreshments after the meeting were through the courtesy of the F. B. Stevens Co. and their local representative, **Harry M. Brown.**

R. M. Clinchens
Secretary

DETROIT

Joint Meeting with Plating Institute

The third meeting of the 1957–58 series was held on Friday, Nov. 1 at the Statler Hotel in Detroit. This was a joint meeting with the Plating Institute of Michigan and was opened by Branch President **Glenn Friedt Jr.**

Branch Secretary **Ed Kubis** introduced 15 applicants for membership and with their acceptance brought the branch enrollment to 694.

Webb Knight Sr., president of the

Knight Plating Co. and president of the Plating Institute of Michigan served as technical chairman and prior to introducing the evening's speaker gave an enlightening talk outlining the structure of the Plating Institute, its purpose and programs and the success it has enjoyed to date. Webb promised a few laughs along the way and the audience was not disappointed, but there was a sober and serious side too and Webb demonstrated his adeptness. He elaborated on the current program which is to acquaint the platers of Michigan with the fact that they must work together for the good of all. Webb also stated that basically the Institute's goal is to raise the electroplating industry to the heights it rightfully deserves and to bring the platers of Michigan together in their thinking and dispel the "dog eat dog" attitude which has prevailed to some extent in the past. He said, for the first time in his memory, platers of this area are willing to sit down at an Institute meeting and talk on their common problems such as prices, costs, standards, etc.

The speaker of the evening, **Allen R. Klomps,** Sunbeam Corp. of Chicago, gave a very informative talk on Sunbeam's experience with production plating with P.R.—WES-X copper. Mr. Klomps covered all phases of the subject from the selection of the proper equipment, solution make-up, current densities, what to expect in uniformness and leveling, filtering and cooling the solution. He particularly expressed the importance of proper equipment selection, that is, careful consideration should be given as to tank size, the construction of anode diaphragming device, the solution filters and cooling apparatus and practically every detail of the installation. An interesting disclosure by Mr. Klomps was that solution circulation is of utmost importance and the Sunbeam Corp. has ascertained that ½ gal of solution per square foot of diaphragm area should be pumped into the diaphragm anode section per minute.

The Detroit Branch expressed appreciation to Mr. Klomps for an interesting talk. Refreshments were served.

Robert J. Amis
Publicity Chairman

HARTFORD

Jumer Speaks on Electropolishing

The regular Branch meeting was held at the Hotel Bond on Nov. 18 and 63 members and guests were present. Preceding the meeting a movie in color was shown entitled "St. Lawrence Power Project."

The guest speaker for the evening was **John F. Jumer** whose subject was "Electropolishing." Mr. Jumer represents the Electro-Glo Co.

Mr. Jumer explained the mechanism of electropolishing which accounts for the brightening and leveling action. An anodic film covers the surface of the metal, thicker in the valleys than at the peaks, a higher current density at these coarse peaks produces the leveling action as these peaks are removed by macro polishing. The smaller peaks are removed by a micro polishing as an equilibrium is established between the dissolution of the metal and diffusion, time required is from 6 to 12 min. A short history of electropolishing followed with comments on the various baths used and type of metals used. Some reasons for electropolishing are for: superior reflectivity, burr removal, size control, improving adhesion of plated metals, improving corrosion resistance, descaling, micro-inch improvement, increasing fatigue life and for electromachining.

Edward LaCroix was technical chairman for the evening.

Stanley Platoz
Secretary

INDIANAPOLIS

Propose Max and Evans for Achievement Award

On Nov. 6, 40 members and guests attended our regular meeting at Fox's Steak House. **Bert Hawhee** commended **Paul Johnson** of Guide Lamp Co. for bringing the most prospective members.

Dr. Max advised that lack of applicants for the electroplating class would delay its formation until January.

Seven applicants for membership were accepted.

Marshal Whitehurst reported that the committees for the January Interim meeting were progressing on schedule.

Quentin Shockley received a reply from National Headquarters acknowledging receipt of the names of Dr. Max and **Thomas Evans** as candidates from this Branch for the AES Scientific Achievement Award.

Bert Hawhee appointed **Edna Rohrabaugh, Addison Howard** and **Les Reynolds** on a committee to make arrangements for Ladies Night in March 1958.

The Branch gave a rising vote of thanks to the Columbus members for the splendid October meeting.

Librarian Addison Howard announced that **Ed Bruck** would moderate in a round table discussion. He chose Dr. Max, Quentin Shockley and **Elmer Lundberg** as panel helpers. Their answers helped to supply specific points to watch for in handling individual problems.

Paul Freeman
Secretary

KANSAS CITY

Bylaws Adopted; Past President's Pins Presented

The Kansas City Branch AES met in regular monthly session, Thursday Oct. 10,

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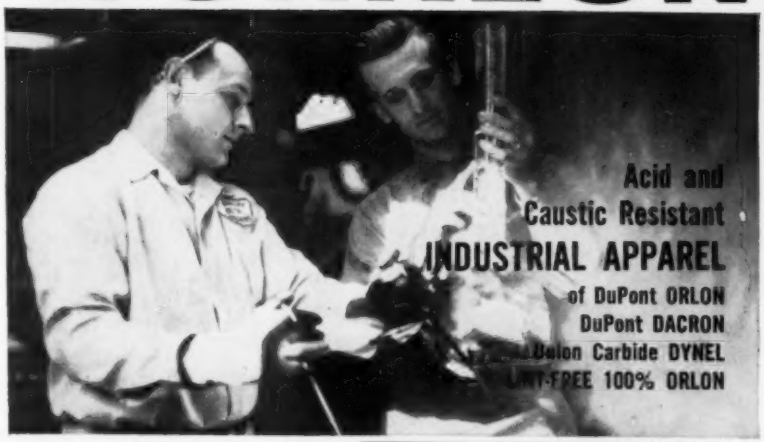

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1957 at the Berkshire Hotel with 16 members and one guest in attendance.

In accordance with a motion passed at the previous meeting, Past President's Pins were presented to **Herb Clark** and **William Brumwell.** Pins were also ordered sent to **J. V. McCandlish** and **Lou Barkley.**

The Bylaws Committee, submitted the proposed set of bylaws. After hearing them read, they were discussed, amended and passed, section by section.

An application for membership was presented and the applicant was elected.

Due to the amount of time consumed in adopting the bylaws, Librarian **Scott Sterrett,** announced that the program he had planned would not be presented at that time. There was more discussion on the subject of waste disposal and a speaker on this topic was promised for the next meeting.

Robert L. Garrett
Secretary

KANSAS CITY

Waste Disposal Presented by Summers

The Kansas City Branch held its regular monthly meeting Nov. 14, 1957 at the Berkshire Hotel. After a steak dinner at 7 p.m., the meeting was called to order at 8. Twenty-one members and eight guests were present.

President **George Becker,** noting that Past President **J. V. McCandlish** was present, and since the Past President's pin had not yet been sent to him, made the presentation.

One applicant for membership was elected.

The meeting was turned over to Librarian **Scott Sterrett,** who introduced the speaker of the evening, **Glenn Summers,** of Wichita Kansas who is Industrial Water Service Engineer at the Boeing Airplane Co. in that city, and a member of the Wichita Branch AES.

Mr. Summer's talk was divided on two subjects: First, the waste disposal operation of the City of Wichita, and how it is helping the job shops in that area. Second, the waste disposal plant operated by his company. He also showed some color photographs of the plant.

Robert L. Garrett
Secretary

LANCASTER

Sonnenfeldt Compares American and European Plating

The regular meeting of the Lancaster Branch was held at the Old Mill, Lancaster, Pa. on Nov. 8, with 30 members and guests present in spite of the inclement weather.

Two new members were elected. In addition six new applications for membership were received for branch approval.

A very informative talk was given by **Rene Sonnenfeldt** of the Sel-Rex Corp. on the "Comparison of European and American Plating Practices." Many interesting and humorous anecdotes concerning Rene's experiences in trouble shooting in Europe were very well received.

A buffet lunch was served to conclude an interesting and productive meeting.

Very truly yours,
Robert Plaisted
Secretary-Treasurer

LOS ANGELES

Saltonstall Discusses Nickel Plating

The first fall meeting of the Los Angeles Branch was held on Wednesday evening, Sept. 11 at the Roger Young Auditorium. Following dinner, the business meeting was called to order by President **George Magurean.**

Sergeant-at-Arms **Milton Weiner,** introduced the visitors. **George Hetz** officiated at the introduction of prospective new members.

P. Simon, general chairman of our Annual Technical Session, reported that the Carrol Wax Orchestra has been engaged and that several different hotels have been contacted and have submitted their bids for the sessions and banquets. These will

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be considered and a decision made in the near future.

Under the items of new business, the names of several American Electroplaters' Society members, both local and out of town were presented to the Branch for possible employment.

Librarian **Frank Virgil,** then introduced the speaker, **Dr. R. B. Saltonstall,** technical director of the Udylite Corp. Dr. Saltonstall gave a very informative and interesting talk on nickel plating in general, dwelling particularly on bright nickel and also acquainted us with some experimental results of the effect of plating conditions on the characteristics of chromium plate as applied over bright nickel. A very lively question and answer period followed his presentation.

Emmett H. Babcock
Branch Secretary

LOS ANGELES

John Merigold Made Branch Honorary Member

The regular monthly meeting of the Los Angeles Branch was held at Roger Young Auditorium on Wednesday, Oct. 1, 1957.

There were 105 guests and members present. The guests were introduced by Sergeant-at-Arms, **Milton Weiner.**

N. McEwan, 1st vice president, introduced seven prospective members and one new member was inducted.

A favorable report on the proposed Branch Handbook was made by the chairman of the Handbook Committee, **L. O'Neil.** The report of our Research Committee Chairman **K. Johnson,** included a brief survey of the active projects and of recently published reports from the National Committee.

Under the heading of old business, the slate of candidates for delegates and alternate delegates to the National Convention was placed before the membership by the Nominating Committee and voted upon with the following results.

Delegates: **E. H. Babcock, L. T. Stoner, E. W. Arnold;** Alternates: **Tony Stabile, G. J. Hetz, Leo Missel.**

Earl Coffin nominated **John Merigold,** one of the real old timers in plating for honorary membership in the Los Angeles Branch. The election carried unanimously and Mr. Merigold will be notified. **Harvey Hunt** then announced that **A. Perkins** had suffered a heart attack approximately four weeks previously and was now convalescing satisfactorily. Cards and visits would be appreciated.

The meeting was turned over to our librarian, **Frank Virgil,** who presented our speaker, **Bert Sherwood,** general manager of Chemplate Corp. Mr. Sherwood was assisted in his presentation by **Ed Zorn,** sales manager of Chemplate. Their presentation was on the application of, and processing for, immersion nickel plating. It was very informative and practical, with many illustrations and the "do's and don'ts" involved. They told of its practical application and its limitations. There was a great deal of interest as evidenced by the many interruptions and questions from the floor and the lively and long question and answer period which followed their talk.

Emmett H. Babcock
Branch Secretary

LOUISVILLE

Will Host 1959 Tri-State; Hafer Speaks on Anodizing

The regular monthly meeting of the Louisville Branch was held on Thursday, Nov. 21, 1957 at Hasenour's Dining and Cocktail Lounge, Louisville. Nineteen members and guests were present.

A discussion of the Interim Meeting was held, and **Ed Bruck** of the Indianapolis Branch outlined the schedule and urged our attendance.

It was decided by the Branch that we would host the 1959 Tri-State Meeting. Chairman **Kenneth C. Reifsteck** will start making plans immediately and will set the date shortly.

Duke T. Scott announced a request from the Atlanta Branch, where he recently visited, that we support their bid for the 1962 National Convention.

The meeting was then turned over to Librarian Reifsteck, who introduced the

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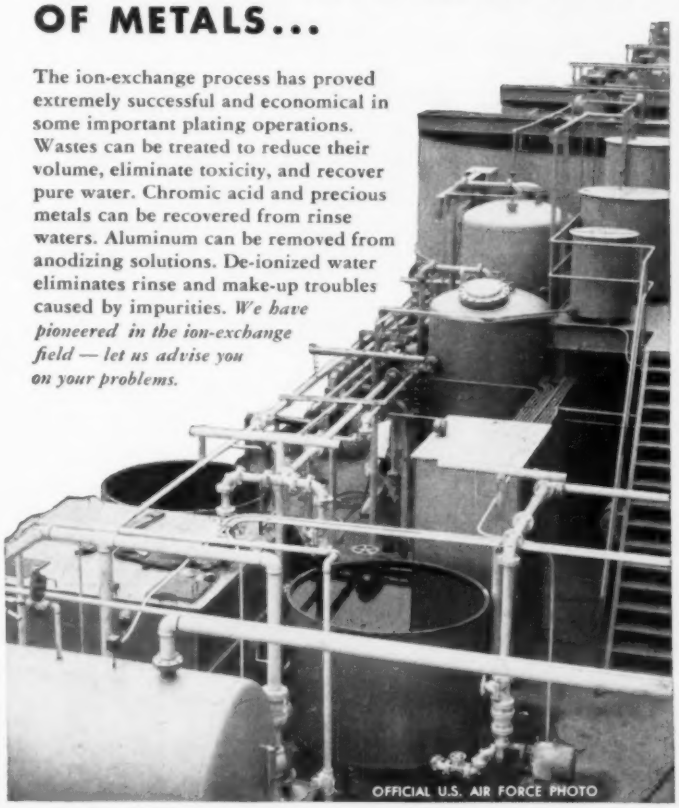

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speaker for the evening, **Richard Hafer** of Reynolds Metals Co., Louisville, Ky. Mr. Hafer's topic was "Anodizing Aluminum." His very enlightening presentation, which was supplemented with colored slides, dealt with sulfuric and chromic acid anodizing, color anodizing, effects of anodizing different alloys, and the many uses for anodized aluminum. A lively question and answer session followed, and Mr. Hafer was heartily applauded for a most informative talk.

Frank E. Wilcher
Secretary-Treasurer

MILWAUKEE

Inorganic and Organic Sessions Hear Papers by Gary and Brooks

The 483rd regular meeting of the Milwaukee Branch was called to order by President **E. H. McCoy** at the Maryland Hotel on Nov. 1, 1957.

Frank Marshall, chairman of the membership committee, reported on his program and appointed **Lon Warneke** and **Ben Coughlin** as members of his committee.

Hilton Smith was introduced to the membership as a transfer from Attleboro Branch. Six men were elected to membership.

Fred Andersen, chairman of the Annual Meeting Committee, reported and requested suggestions for a theme around which the educational session could be organized.

The chair called upon **Les Diveley** the chairman of the Bylaws Amendment Committee to give his report on the structure of the National Society and the relationship of the Branches to the National Society. Mr. Diveley presented the committee's suggested changes to the Branch Bylaws which would make them conform to the recently amended National Constitution whose provisions now require Delegates to be elected and installed in September. It was also the opinion of the committee that the present Delegates serve until their successors are elected and that the election need not be held until the next regular election in May 1958. Delegates then elected would be installed in September 1958.

The secretary read a letter from the Chicago Branch requesting approval of the Milwaukee Branch to send one or more of its delegates to the Chicago Branch Annual Meeting for the purpose of organizing a Regional Committee to handle the 1962 Exposition-Convention.

The program chairman, **E. Peillusch,** introduced the speakers of the evening.

At the inorganic session—**S. T. Gary,** consultant on plating problems at Scientific Control Laboratories, presented a paper on "Hard Chrome Plating."

At the organic session—**W. R. Brooks,** director of the customers research laboratory, Binks Manufacturing Co., spoke on "Manual and Automatic Paint Application."

S. Taterzynski
Secretary-Treasurer

MONTREAL

Brumbaugh Talks on Protective Coatings

The meeting was opened by President **P. M. Coady** with 16 members present.

In the absence of Librarian **J. Rennie,** Mr. Coady introduced the speaker for the evening, **G. E. Brumbaugh** of American Chemical Paint Co., Ambler, Pa. His talk was on "Protective Coatings." After a very interesting talk Mr. Brumbaugh offered to answer questions put to him by the members. He was thanked on behalf of the branch by **J. T. Reisenburg Sr.**

After a short recess the meeting resumed for the business session.

Delegates and Alternates to the 1958 Convention were appointed: Delegates: **G. R. Davidson, John Kane, J. G. Carrique;** Alternates: **M. Cohen, W. Glover, J. T. Reisenburg Jr.**

The secretary was instructed to send a "Get well" card to J. G. Carrique who was in the hospital.

NEWARK

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Branch was attended by about 90 members and guests. Two applications were received, and four applicants approved by the Board of Managers were elected to membership.

President **Grigat** commended the Educational and Banquet Committee on the activity thus far in the year--four meetings planning Branch activities already have been held. Bill also appointed **Helen Maroney** as official Newark Branch "Greeter" to assist Sergeant-at-Arms **John Banta** welcoming members and guests at each meeting.

Dodd Carr reported on the banquet plans for December and **Cy LaManna** on the Electroplating School planned early in 1958, stating that registrations must be made promptly.

Don Foulke reported interest in a joint Regional Annual Meeting with New York Branch and that President Grigat had appointed **George Wagner,** Don Foulke and Dodd Carr to explore the possibility.

Fred Meyer reported the meeting evaluation sheets distributed and returned at the September meeting indicated satisfaction with the program and he asked for suggestions at any time as to how the programs can be improved. Secretary Foulke reported with regret the passing of Mrs. Tom Trumbour, mother of Newark Member **John Trumbour** and wife of AES Honorary Member, **Thomas Trumbour.**

Librarian Meyer introduced **Paul Theusen** of Metal Processing Co. who talked on "Electroless Nickel", discussing the properties of this type of deposit and describing applications for that plating technique. A number of colored slides described applications.

Stanley Rich of General Ultrasonics was then introduced as the main speaker of the evening. He lucidly described the theory of ultrasonics, the equipment available and the applications for which the technique is particularly useful. After an extended question-and-answer period, both speakers were given a rising vote of thanks for their excellent contributions.

D. Gardner Foulke
Secretary

NEW HAVEN

Belt Polishing Subject of Stinely Address

The November meeting of the New Haven Branch was held at Mason Laboratory of Yale University, on Tuesday, Nov. 12. The Technical Chairman for the evening, **Austin P. Jackson** introduced **Russell Stinely** who spoke on the "Latest Developments in Belt Polishing and Flexible Polishing." Mr. Stinely, Sales engineer for Minnesota Mining & Mfg. Co. showed three interesting and instructive films illustrating various uses of belt polishing equipment.

Final plans for the annual Christmas Party which will be held on Dec. 7 were announced. The Christmas Party which takes the place of the December meeting, will be held at the Red Lobster in Milford, Conn. and will feature New England lobster.

E. F. Foley
Historian

ROCHESTER

Korbelak and Bailey Speakers at November Meeting

The November meeting of the Rochester Branch was held at the 40/8 Club House and called to order by President **Frank Beuckman.**

Business matters discussed included the Christmas Party to be held Dec. 7 at the Locust Hill Country Club and the New York State Regional meeting to be held in Rochester in 1958.

The librarian, **Lorin Correll** introduced the first speaker of the evening, **William Bailey** of the Taylor Instrument Co. who talked on the methods of making name plates at the Taylor Instrument Co. He showed representative samples of each step of manufacture of the plates.

The second speaker of the evening was **Al Korbelak** of the Sel-Rex Corp. Mr. Korbelak gave a very descriptive talk on the practical aspects of modern day filtration covering the whole story from contamination to sludge removal of the filter.

Linwood P. Morrison
Secretary-Treasurer

ROCKFORD

Pohlman Presents Organic Finishing Paper

The November meeting of the Rockford Branch was held Monday, Nov. 11 in the Winnebago Room of the Faust Hotel.

Thirty-eight members and guests were

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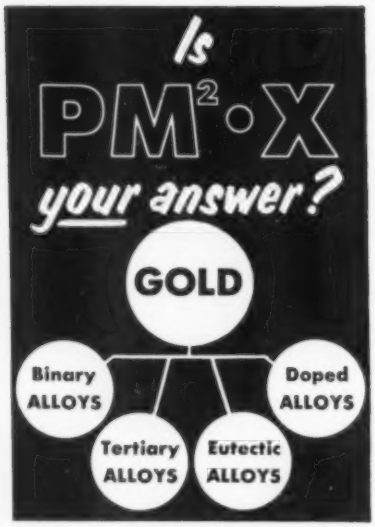

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on hand for the dinner and 49 were present for the meeting which followed.

Branch business was transacted rather hurriedly so as to allow as much time as possible to the speaker of the evening. We were fortunate to have with us **Fred W. Pohlman** industrial development engineer of the Glidden Co. His topic was "Some Modern Aspects of Industrial Organic Finishing."

Mr. Pohlman discussed, manuel spray methods, hot spray methods, electrostatic spray, grid type and Ransberg No. 2, dip, flow coat, roll coat applications and strip coating. The advantages and disadvantages of the above systems were given, accompanied by slides. This was an outstanding paper and very expertly given.

E. J. Buddin
Secretary-Treasurer

ST. JOSEPH VALLEY

Electroplating Course Considered; Blount Recounts Japan's Electroplating Industry

The October meeting of the St. Joseph Valley Branch was opened with a round robin of introductions. President **Art Wiegand** presented the new officers elected at the May Meeting. Second Vice President **Duke Wysong** was absent because of his required presence in Indianapolis with respect to plans for the January Interim Meeting.

Applications of six prospective members were read. President Wiegand announced that our branch had won the previous year's membership award and urged those present to do their utmost in an effort to repeat. Vice President **Ray Dearth,** Membership Chairman, advanced the idea that each member attempt to bring in one new member.

Delegates to the 1958 Convention in Cincinnati were chosen and include: Duke Wysong, **Gene Roth** and **Henry Meers.** Alternates are to be: Ray Dearth, **Harold Wiesner** and **Ralph Brouwer.**

Dr. Wiesner spoke on the possibility of the branch sponsoring further electroplating courses and urged prompt response to the question on reservation cards. The educational committee selected included Dr. Wiesner, **Ernest Wilhelm,** Duke Wysong, Ralph Brouwer, **A. B. Matern, William McDowell** and **Lou Rague.**

A welcome visitor was **Paul Glab,** secretary of the Chicago Branch, who gave particulars concerning the 1962 Midwest Regional Convention. The latter is to be a joint effort of smaller surrounding branches in cooperation with the Chicago Branch. He asked for the appointment of delegates to attend an organizational meeting to aid in the planning and formation of the 1962 convention.

After a glowing report of the Montreal Convention by President Wiegand, the meeting was turned over to Gene Roth, past president, who introduced **Ezra Blount,** editor of *Products Finishing.* He is a past president of both the Indianapolis and Cincinnati Branches and is also co-chairman of the coming year's convention in Cincinnati. After being recalled to duty in the Air Force for the Korean conflict, he was stationed in Japan. One of his assignments was to survey Japanese industry as a possible supply source for the Air Force. The Japanese plating industry is totally geared to hand operation. There are 3000 plating shows, employing 25,000 people. Their anode metal is of poor quality. They have little if any exhaust systems and no heat either for the plating baths or the buildings. No formulated cleaners are used, no rack coatings, tank liners, wetting agents or inhibitors. The most surprising fact is that the quality of work as evidenced on Japanese cameras and other optical equipment is of such a high degree, using such archaic and obsolete methods. Technical and trade organizations are totally divorced from one another in Japan.

Mr. Blount showed both slides and movies to clarify and point-up his subject matter to good advantage. The evening as a whole was very enjoyable and extremely informative. A rising vote of thanks was accorded Mr. Blount at the conclusion of his talk.

Henry A. Meers
Secretary-Treasurer

ST. LOUIS

Brady Speaks on Chemical Trends

The regular monthly dinner meeting of the St. Louis Branch was held at the York Hotel Nov. 13. The business meeting was opened by our President **Craig McAlister** who asked each person to stand and identify himself and his company. There were 31 members and guests present. The meeting was highlighted by the presentation of 11 applications for membership. **William Piel,** our second vice president and chairman of the membership committee, thanked the people from Acme Rustproof and Siegel Robert Plating for their work in getting the new members. He also asked that each member try to get one new member.

Edward Sertl reported the plating school was being well attended. He said we should encourage the students to take an interest in the Society since they will become the backbone of the organization in future years.

A. P. Julius was called upon to report the progress made by the committee appointed to survey the facilities for a National Convention in St. Louis. He reported he had contacted the convention bureau of St. Louis and they welcomed the idea. A meeting of the officers and board of managers was held at Craig McAlister's

house and it was decided we would try to gain support to have the convention here in 1963 or 1964.

Our librarian introduced **James Brady** of McDonnell Aircraft Corp. whose talk "Chemical Trends in the Aircraft Industry," was preceded by a film showing the development of the 101 Fighter. With the aid of slides Mr. Brady was able to show many factors which affect the trends in aircraft manufacturing. Three of the prime factors are: Saving weight, speed and alloys having high strength properties. A very interesting point brought out in his talk was the superior fatigue limits cadmium has when plated from the fluoborate bath. Nickel sulfamate baths plate nickel which presents very few problems as far as fatigue limits are concerned, he said.

In summarizing, Mr. Brady stated plating and metal finishing is becoming more important in aircraft manufacturing. After a question and answer period the meeting was adjourned.

Ward Kelly
Secretary

SOUTHEASTERN

Benner on Impurities

On November 8, **H. L. Benner** of E. I. DuPont de Nemours & Co., spoke to the Southeastern Branch on the "Effects of Impurities in Cyanide Plating Solutions", illustrating with color slides of test panels and answering our many questions. One application for membership was announced. **Howard Bone,** chairman of the 1958 Technical Session Committee reported on the progress of the committee. **The Southeastern 3rd annual Technical Session with participation of Miami and Blue Ridge is shaping into the biggest plating festival ever held in the South. Speakers for the occasion are R. V. Vanden Berg of Alcoa, Dr. Richard B. Saltonstall of Udylite, Clarence H. Sample of International Nickel, Henry Mahlstedt of Metal and Thermit, and Walter Pike of Hanson-Van Winkle-Munning Co.**

Robert H. Probert
Secretary-Treasurer

SPRINGFIELD

Chromate Coatings Discussed by Mitchell

Harold L. Mitchell, technical director and manager of sales for metal finishing products, Chemical Corporation of Springfield, Mass., drew the largest turnout of any speaker at a regular monthly meeting of the Springfield Branch in the past several years.

Mitch discussed as his subject, "Chromate Conversion Coatings, History, and Some Applications." There also was a sound-color film along with the talk. The subject was covered so completely, that there were very few questions in the discussion period.

Among the guests present were **Ralph McCahan,** DuPont, of Hartford; **Jack MacDermid** and **Jim Ennis,** MacDermid, Inc. of Waterbury; **Norman Plank,** General Electric, Pittsfield.

The Springfield Branch is in the process of formulating an advanced course in electroplating, to follow last year's course in basic fundamentals. More on this, later, as **Larry Fountain,** committee chairman, gleans the information and reports.

Henry L. Heissfeld
Secretary

TORONTO

Seyb Speaker at Well-Attended Meeting

The Toronto Branch held its November meeting in the King Edward Hotel, the reason being that alterations were going on at the old stand, the Royal York. Forty-four were on hand for dinner and 55 attended the meeting. **Mel Green** presided.

The speaker introduced by "Mr. Chromium" **Jim Guffy** was **Dr. Edgar J. Seyb** of Metal and Thermit Corp. His topic was "Technical Aspects of Self-

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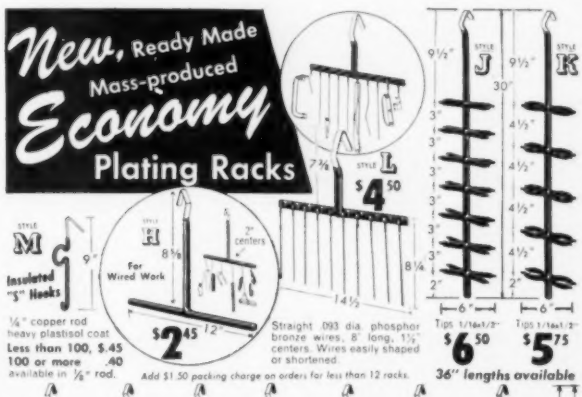
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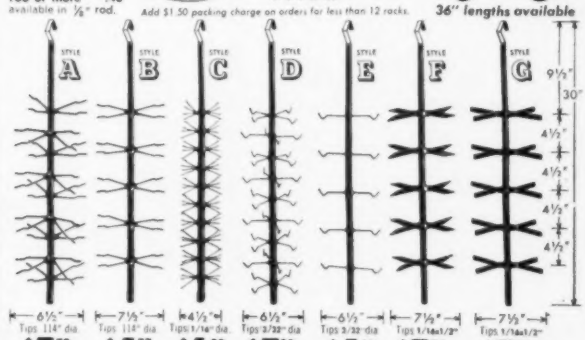

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Regulating High Speed Chromium." He illustrated his talk with slides.

The question period was quite lengthy and the doctor was extended a hearty vote of thanks proposed by **Pat Patterson.** However, he was still answering questions long after adjournment at 10:30 p.m. Thanks again, Dr. Seyb.

A. W. Wilson
Librarian

TWIN CITY

Andrus Talks on Anodizing

The Twin City Branch of the AES held its November meeting on the 4th at Jax Cafe in Minneapolis, Minnesota.

Forty-six per cent of the membership of 87 attended this meeting.

An interesting and informative lecture on "Decorative Anodizing and Dyeing of Aluminum" was delivered by our guest speaker, **Joseph Andrus,** of Croname Inc., Chicago. A short question and answer period followed.

John M. Zangs Jr.
Librarian

WATERBURY

Sonnenfeldt Proves Interesting on Two Subjects

The Waterbury Branch held their regular monthly meeting Thursday, Nov. 14 at the Roger Smith Hotel.

The attendance at the dinner and also at the meeting was the largest of the season. President **Spencer Henn** presided. He introduced **Harry Robins** of the Lawrence Smith Co., Sydney, Australia, who is visiting this country. Mr. Henn also introduced two new members.

Technical Chairman **George O. Jabs** conducted the educational program. It started with the showing of a movie of the "Shepaug Dam." This was very interesting, as it showed the progress of construction from beginning to end.

The speaker was **Rene Sonnenfeldt,** sales engineer, Sel-Rex Corp. His subjects were "Precious Metal Plating in Modern Industry Today," and the "Status of Electroplating in Europe." Although Mr. Sonnenfeldt has been in this country for only two and one-half years he made himself very well understood and was an interesting speaker.

Isidore Cross, librarian, discussed plans for the Sustaining Members' Night to be held Feb. 14, 1958.

The Waterbury Branch has formed a committee to set-up an employment clearing house. We are trying to get the help of all companies who employ platers in finding out their requirements for men. We would also like to know when any experienced plating room man needs a job. If you have any openings or need a job, please contact any member of the committee: **Jim Kennedy,** PL 4-3118; **George Jabs,** PL 6-4451; **Frank Schneiders,** CR 4-1686.

Louis Porretti, chairman of our Christmas Party Committee, announced that our Party would be held at D'Angelo's Restaurant on Dec. 12.

Nicholas Topazio
Publicity Director

WESTERN ONTARIO

Contribute $100 to AES Research Fund

The meeting was held on Friday, Nov. 15, at the Wm. Pitt Hotel in Chatham.

President **Earl Patterson** chaired the meeting which was attended by 23 members and guests.

Following a brief financial report by **Art. Campbell,** the membership unanimously agreed that we contribute one hundred dollars to the AES Research Fund.

Arrangements are being made for our popular Ladies Nite Dinner-Dance to be held at the Wm. Pitt on Friday, Jan. 17.

Glen F. Prielipp of Dow Chemical Co., was guest speaker. His subject was "The Application of ION Exchange Resins to the Electroplating Industry." Mr. Prielipp outlined the technological advances in this new process and then discussed its specific applications in our industry.

D. R. Mainland
Vice President

Series 105

TANK LINING QUIZ

Will your present tank lining meet all ten conditions below? It will, **and more,** if it's...

Amer-Plate
PVC TANK LINING

	Yes	No
1. Will it adhere directly to concrete without costly metal interlining?	☐	☐
2. Will it withstand hard chrome liquor to 160° F.?	☐	☐
3. Is it unaffected by strong acids and oxidizing materials?	☐	☐
4. Is it resistant to highly corrosive salts?	☐	☐
5. Will it resist alkalis, including 50% caustic soda?	☐	☐
6. Is it insoluble in aliphatic alcohols, glycol and glycerine?	☐	☐
7. Is it impervious to diesel oil, sour crude, aliphatic petroleum hydrocarbons?	☐	☐
8. Is it non-toxic in food and beverage service?	☐	☐
9. Is it also supplied with T-ribbed back, for casting into place in new concrete tanks?	☐	☐
10. Are expert applicators available in all major cities?	☐	☐

If your present tank lining material scores NO on any point that is important to you, it's time to consider the lining that passes ALL the tests... AMER-PLATE POLYVINYL CHLORIDE SHEET! For complete information and name of nearest applicator, write:

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AES Membership Report

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Hamilton: D. B. Ballinger

Indianapolis: M. L. Grantham, W. K. Hall, J. F. Hensley, W. J. Kosowicz, N. V. Peters, R. N. Snyder, K. L. Turpin

Kansas City: G. B. McDowell, D. M. Nightwine

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Los Angeles: C. R. Simon

Miami: F. V. Allen, T. N. Clark Jr.

Mohawk Valley: T. Duvall, S. Kozien, E. Warner

Newark: Helen Maroney, C. Rust, C. A. Rutgers, S. F. Stross

New York: K. F. Greene, N. Kameno, M. Knazik, T. D. Mahoney, E. H. Poplawski

Philadelphia: K. W. Clayton, M. A. Hemmerle, R. E. Morris

Pittsburgh: A. Sandler

Rochester: F. L. McNutt

Seattle-Puget Sound: F. A. Carson

Southeastern: S. L. Huffman

Twin City: R. Beatty, B. J. Marben, W. R. Schaaf

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Detroit: H. A. Lane, V. J. Linsdeau

Hamilton: S. Sutton

Pittsburgh: R. Diaz, H. L. Franks, W. H. Wooster

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Detroit: G. G. Hoehne to Baltimore-Washington

Newark: J. Muscarella Jr. to Louisville, R. Sonnenfeldt to Syracuse

Philadelphia: G. H. Cook from Chicago

Saginaw Valley: L. B. Belanger to Detroit

Waterbury: E. V. Collins to Newark, J. E. Kennerly from Southeastern

RESIGNATIONS

Twin City: T. Ballentine, R. Smith

SUSPENSIONS

Hartford: V. Dunbar

Newark: W. Nattrass, Z. Paroczay

San Antonio: R. L. McGowen

MANUAL AVAILABLE TO BRANCHES

As a reference source to help Branches and Branch officers in effective Branch operation, many dedicated National and Branch leaders collaborated, without any remuneration, in preparing the comprehensive BRANCH OFFICERS MANUAL of the American Electroplaters' Society, embodying practically every conceivable Branch operating subject from membership promotion to Delegates' duties.

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INDICATE A 166.

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SITUATION WANTED—Chemist with eight years experience in lab, as production supervisor, and technical sales representative wants position as finishing supervisor or technical sales representative. Reply to Box J1, PLATING, 445 Broad St., Newark 2, N. J.

SITUATION WANTED—Supervisor with 33 years plating experience seeks position, preferably in Wisconsin area. Experience includes 28 years of plating in job shop, 3 years of plating and paint of aircraft, 2 years in automotive plating bonderizing and painting. Will give references. Reply to Box J2, PLATING, 445 Broad St., Newark 2, N. J.

SITUATION WANTED—Plating supervisor seeks position in mid-west section. Will consider other locals. Experience includes 5 years laboratory tech work plus supervision of polishing and plating departments. Reply to Box J3, PLATING, 445 Broad St., Newark 2, N. J.

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PLATING SHOP MANAGER—Thoroughly experienced in all phases of plating, polishing, buffing and plating shop operations invites inquiries from progressive expanding manufacturer for opportunity to grow with organization. Degree plus 18 years practical experience in management, administrative engineering, layout, development, processes and specifications. Capable of installation and operation of entire plant by department. Salary commensurate to responsibility. Reply to Box J5, PLATING, 445 Broad St., Newark 2, N. J.

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FUTURE MEETINGS

AES

January	10-12—**Executive Board Meeting,** Hotel Marott, Indianapolis, Ind.
January	11—**5th Interim Meeting, Supreme Society,** Hotel Marott, Indianapolis, Ind.
January	25—**Chicago Branch,** 45th Annual Educational Session and Banquet, Conrad Hilton Hotel, Chicago, Ill.
February	1—**New York Branch,** Annual Educational Session and Banquet, Hotel Statler, New York, N. Y.
February	14-15—**Southeastern Branch,** 3rd Annual Technical Session, Dinkler-Plaza Hotel, Atlanta, Ga.
February	15—**Cleveland Branch,** Annual Educational Session and Dinner Dance.
February	15—**Grand Rapids Branch,** Annual Banquet, Pantlind Hotel, Grand Rapids, Mich.
April	12—**Baltimore-Washington Branch,** Annual Banquet, Park Plaza Hotel, Baltimore, Md.
May	3—**Boston Branch,** Annual Educational Session and Banquet, Hotel Statler, Boston, Mass.
May	19-22—**45th AES Annual Convention,** Sheraton-Gibson Hotel, Cincinnati, Ohio.
June	14-18—**Golden Jubilee Convention and International Exposition,** AES, Detroit, Mich.

INTERSOCIETY

January	27-30—**Plant Management and Engineering Show,** International Amphitheatre, Chicago, Ill.
January	28-31—**Society of Plastic Engineers, 14th Annual Technical Conference,** Sheraton-Cadillac Hotel, Detroit, Mich.
February	10-14—**American Society for Testing Materials,** Committee Week, Statler Hotel, St. Louis, Mo.
March	17-21—**National Association of Corrosion Engineers, 14th Annual Conference,** Civic Auditorium, San Francisco, Calif.
May	5-7—**13th Purdue Industrial Waste Conference,** Purdue Memorial Union Building, Purdue University, Lafayette, Ind.
June	22-28—**American Society for Testing Materials,** Annual Meeting and Exhibit, Hotel Statler, Boston, Mass.
June	9-12—**National Materials Handling Exposition,** and American Society of Mechanical Engineers National Conference on Materials Handling, Public Auditorium, Cleveland, Ohio

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(As of January 1, 1957)

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13 Sedgeford Rd., Myrtle Bank, South Australia
Meeting Place: 17 Waymouth St., Adelaide
Day of Month: First Friday
Sustaining Members:
None

ALLENTOWN-READING

Secretary-Treasurer: Raymond Housel
363 Warren St., Phillipsburg, N. J.
Meeting Place: Scotty's Anchorage, Emmaus, Pa.
Day of Month: Fourth Thursday
Time: Dinner 7:00 P.M.—Meeting 8:00 P.M.
Sustaining Members:
Bethlehem Steel Co. (2), Bethlehem, Pa.
L. F. Grammes & Sons, Inc., Allentown, Pa.
The New Jersey Zinc Co. (of Pennsylvania) (3), Palmerton, Pa.

BALTIMORE-WASHINGTON

Secretary: Edward E. Oberland
2500 Broening Highway, Baltimore 24, Md.
Meeting Place: Chemistry Bldg., National Bureau of Standards, Washington 25, D. C.
and
Marling House, 20 E. Fayette St., Baltimore, Md.
Day of Month: Second Tuesday
Time: 8:00 P.M.
Sustaining Members:
Allied Research Products, Inc., Baltimore 5, Md.
American Instrument Co., Silver Spring, Md.
Atlas Powder Co., Wilmington 99, Del
E. I. duPont de Nemours & Co., Inc., Wilmington 98, Del.

BOSTON

Secretary-Treasurer: Dr. George P. Swift
53 Galen St., Watertown 72, Mass.
Meeting Place: Hotel Statler, Boston, Mass.
Day of Month: First Thursday
Time: Dinner 6:00 P.M.—Meeting—8:00 P.M.
Sustaining Members:
American Anodizing Corp., Quincy, Mass.
M. E. Baker Co., Cambridge, Mass.
Beacon Supply Co., Chelsea, Mass.
F. L. & J. C. Codman Co., Rockland, Mass.
United-Carr Fastener Corp., Cambridge 42, Mass.

BRIDGEPORT

Secretary-Treasurer: Robert G. Parker
25 Beverly Rd., Trumbull 58, Conn.
Meeting Place: Hotel Barnum, Bridgeport, Conn.
Day of Month: Second Friday
Time: 8:00 P.M.
Sustaining Members:
Electrolux Corp., Old Greenwich, Conn.
Mitchell-Bradford Chemical Co., Bridgeport, Conn.
Roberts Rouge Co., Stratford, Conn.
E. E. Seeley Co. Inc., Bridgeport, Conn.
Yankee Metal Products Corp., Norwalk, Conn.

BRITISH COLUMBIA

Secretary: Jim Lee
366 No. 3 Rd., Richmond-Vancouver, B. C.
Meeting Place:
Sustaining Members:
None

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*Numbers after names of Sustaining Members indicate number of memberships supported.

BUFFALO

Secretary: R. D. Stemmerich
8090 Main St., Clarence, N. Y.
Meeting Place: Niagara Manor, Niagara Falls, N. Y.
Day of Month: 1st Friday
Time: 6:00 P.M.
Sustaining Members:
Van Der Horst Corporation of America, Olean, N. Y

CAPITOL DISTRICT

Secretary: William R. Allison
237 Gifford Road, Schenectady, N. Y.
Meeting Place: The Center Inn, Albany, N. Y.
Day of Month: First Monday
Time: 8:00 P.M.
Sustaining Members:
General Electric Company, Schenectady, N. Y.
Sprague Electric Company, North Adams, Mass.

CENTRAL MICHIGAN

Secretary-Treasurer: E. J. Bosca
411 Third St., Jackson, Mich.
Meeting Place: Roosevelt Hotel, Lansing, Mich.
and
Hayes Hotel, Jackson, Mich.
Day of Month: First Tuesday
Time: 7:00 P.M. (Dinner Meeting)
Sustaining Members:
None

CHICAGO

Secretary-Treasurer: Paul Glab
882 N. Paulina St., Chicago 22, Ill.
Meeting Place: The Western Society of Engineers, 84 E. Randolph St., Chicago, Ill.
Day of Month: Second Friday
Time: 8:00 P.M.

Sustaining Members:

Acid Products Co., Inc., Chicago, Ill.
Allied Industrial Products, Inc., Chicago, Ill.
American Buff Co., Chicago 16, Ill.
American Cabinet Hardware Corp., Rockford Ill.
American Can Co., Maywood, Ill.
American Nickeloid Co., Peru, Ill.
Amphenol Electronics Corp., Chicago 50, Ill.
Apex Plating Co., Chicago 7, Ill.
Apollo Metal Works, Chicago 38, Ill.
Ardco, Inc., Chicago 38, Ill.
Arrow Plating Co., Inc., Chicago 47, Ill.
Atlas Plating Works, Cicero 50, Ill.
Bastian Blessing Co., Chicago 30, Ill.
Belke Mfg. Co., Chicago, Ill.
Bell & Howell Co., Chicago 45, Ill.
Berteau-Lowell Plating Works, Chicago 47, Ill.
G. S. Blakeslee & Co., Cicero, Ill.
Chicago Electroplaters' Institute, Chicago 1, Ill.
Chicago Roller Skate Co., Chicago 24, Ill.
The Clinton Co., Chicago, Ill.
The Crane Co., Chicago 5, Ill.
Croname, Inc., Chicago 13, Ill.
Crown Rheostat & Supply Co., Chicago 18, Ill.
The Diversey Corp., Chicago 13, Ill.
R. R. Donnelly & Sons Co., Chicago, Ill.
Duro Chrome of Chicago, Inc., Chicago 12, Ill.
Ekco Products Co., Chicago 39, Ill.
Electro-Glo Co., Chicago, Ill.
Felt & Tarrant Mfg. Co., Chicago 22, Ill.
General American Trans. Corp., Kenigen Div., Chicago 90,
Graham Plating Works, Chicago, Ill.
Great Lakes Industries, Inc., Chicago 39, Ill.
Hardwood Line Mfg. Co., Chicago 47, Ill.
Industrial Filter & Pump Mfg. Co., Chicago 50, Ill.
Kaynide Div., Kraft Chemical Co., Chicago 8, Ill.
Kelite Products, Inc., Los Angeles, Calif.
Kocour Co., Chicago 32, Ill.
R. Lavin & Sons, Inc., Chicago 23, Ill.
Charles F. L'Hommedieu & Sons, Inc., Chicago 23 Ill.
M-W Laboratories, Inc., Chicago 47, Ill.
The Matchless Metal Polish Co., Chicago, Ill.
The Meaker Co., Chicago 50, Ill.
Mechanical Plating Co., Chicago 22, Ill.
Merchants Chemical Co., Inc., Chicago 8, Ill.
Mercil Plating Equipment Co., Chicago 12, Ill.

B. Mercil & Sons Plating Co., Chicago 12, Ill.
Metalcraft Corp., Chicago 10, Ill.
Metal Processing Co., Chicago 12, Ill.
The Modern Plating Co., Chicago 18, Ill.
Modern Plating Corp., Freeport, Ill.
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Northwestern Plating Works, Chicago 23, Ill.
Platers Technical Service, Inc., Chicago 5, Ill.
Plating Service Co., Chicago 39, Ill.
Poor & Company, Promat Division, Waukegan, Ill.
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Reliable Plating Rack Co., Schiller Park, Ill.
Scientific Control Laboratories, Chicago 23, Ill.
J. P. Seeburg Corp., Chicago 22, Ill.
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Standard Plating Rack Company, Chicago 23, Ill.
George A. Stutz Mfg. Co., Chicago, Ill.
Sunbeam Corp., Chicago 50, Ill.
Technic, Inc., Chicago 26, Ill.
Ther Electric & Machine Works, Chicago, Ill.
Time Chemical, Inc., Chicago 9, Ill.
United Manufacturing Co., Chicago 18, Ill.
Western Electric Co., Inc., Chicago 23, Ill.
Western Rust-Proof Co., Chicago, Ill.

CINCINNATI

Secretary: David L. Kaplan
817 Sabino Court, Cincinnati 31, Ohio
Meeting Place: Engineering Society Headquarters, Cincinnati
Day of Month: Fourth Wednesday
Time: Dinner 6:30 P.M.—Meeting 7:30 P.M.

Sustaining Members:

Buckeye Products Co., Cincinnati, Ohio
Products Finishing, Cincinnati, Ohio

CLEVELAND

Secretary-Treasurer: Robert I. Peters, Heil Process Equip.
12901 Elmwood Ave., Cleveland 11, Ohio
Meeting Place: Hotel Carter
Day of Month: First Friday
Time: 8:00 P.M.

Sustaining Members:

Acme Plating Co., Cleveland, Ohio
Advance Plating Co., Cleveland, Ohio
Clevite Research Center, Cleveland 8, Ohio
Cowles Chemical Co., Cleveland, Ohio
Diamond Alkali Co., Chromium Chemicals Division, Cleveland 14, Ohio
Eaton Manufacturing Co., Cleveland 10, Ohio
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Heil Process Equipment Corp., Cleveland 11, Ohio
R. O. Hull & Co., Inc., Rocky River 16, Ohio
Incor, Inc., Cleveland 14, Ohio
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The McGean Chemical Co., Cleveland 9, Ohio
National Screw & Mfg. Co., Cleveland 4, Ohio
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R. W. Renton & Co., Cleveland 3, Ohio
Republic Steel Corp., Cleveland, Ohio
Rockwell Spring & Axle Co., Mishawaka, Ind.
Smoothex, Inc., Cleveland, Ohio
Talon, Inc., Meadville, Pa.

COLUMBUS

Secretary: Halvor Christianson
2593 Andover Rd., Columbus 21, Ohio
Meeting Place: Battelle Memorial Institute, Columbus, Ohio
Day of Month: First Friday
Time: 8:00 P.M.

Sustaining Members:

None

DALLAS-FORT WORTH

Secretary-Treasurer: A. C. Fricke
212 Julian St., Dallas 3, Texas
Meeting Place: Lennox Hotel, Grand Prairie, Texas
Day of Month: Third Wednesday
Time: 6:30 P.M.—Dinner—8:00 P.M.—Meeting

Sustaining Members:

Lane Plating Works, Dallas, Texas

DAYTON

Secretary: Richard M. Clinehens
3206 Harwood St., Dayton 10, Ohio
Meeting Place: Hotel Dayton-Biltmore, Dayton, Ohio
Day of Month: Third Wednesday
Time: 8:00 P.M.

Sustaining Members:

Dayton Rust Proof Co., Dayton, Ohio
General Motors Corp., Frigidaire Division, Dayton, Ohio
National Cash Register Co., Dayton, Ohio
Rack Processing Co., Dayton 9, Ohio
Rawac Plating Co., Springfield, Ohio

DETROIT

Secretary-Treasurer: Edward J. Kubis
Wyandotte Chemicals Corp., Wyandotte, Mich.
Meeting Place: Hotel Statler, Detroit, Mich.
Day of Month: First Friday
Time: 8:00 P.M.

Sustaining Members:

Alco Chemical, Inc., Dearborn, Mich.
Arted Chrome Plating Co., Detroit, Mich.
Auto City Plating Co., Detroit 17, Mich.
Automotive Rubber Co., Detroit 28, Mich.
Bruce Products Corp., Howell, Mich.
Buckingham Products Co., Detroit 27, Mich.
Chrysler Corp. (2), Detroit, Mich.
Congress Die Casting Co., Detroit 34, Mich.
Ford Motor Co. (5), Dearborn, Mich.
Formex Manufacturing Co., Detroit, Mich.
General Motors Corporation, Research Staff (5), Detroit 2, Mich.
Grand Steel & Mfg. Co., Clawson, Mich.
Higgins Rack Coating & Mfg. Co., Hazel Park, Mich.
Hoover Ball & Bearing Co., Adrian, Mich.
Houdaille Industries, Inc. (3), Detroit, Mich.
Howard Plating Industries, Inc., Royal Oak, Mich.
Kaybar, Inc., Birmingham, Mich.
Knight Plating Co., Detroit 7, Mich.
Lyon, Inc., Detroit 28, Mich.
R. C. Mahoney, Detroit 11, Mich.
Master Platers, Inc., Detroit, Mich.
Metal Mouldings Corp., Detroit 28, Mich.
Metal Plating Corp., Oak Park, Mich.
Michigan Chrome & Chemical Co., Detroit 13, Mich.
Midwest Chrome Process Co., Detroit 9, Mich.
George L. Nankervis Co., Detroit 27, Mich.
Nelson Chemicals Co., Detroit 27, Mich.
Northwest Chemical Co., Detroit 4, Mich.
Oakman Manufacturing Co., Van Dyke, Mich.
Plating Inst. of Michigan, Lincoln Park, Mich.
Reed Plating Company, Detroit 11, Mich.
Reilly Plating Company, Melvindale, Mich.
J. J. Siefen Co., Detroit 9, Mich.
Siefen Compounds, Inc., Detroit 38, Mich.
Solventol Chemical Products, Inc., Detroit 3, Mich.
C. D. Sperling Company, Detroit, Mich.
Frederic B. Stevens, Inc. (2), Detroit 16, Mich.
Superior Polishing Company, Van Dyke, Mich.
The Udylite Corp. (3), Detroit 11, Mich.
United Platers, Inc., Detroit, Mich.
Univertical Foundry & Machine Co., Detroit, Mich.
A. T. Wagner Co., Detroit, Mich.
Wagner Brothers, Inc., Detroit 3, Mich.
Whitfield Chemical Co., Detroit, Mich.
Wyandotte Chemicals Corp., Wyandotte, Mich.

GRAND RAPIDS

Secretary: Edwin Krook
1008 S. Ottilia St., S. E., Grand Rapids, Mich.
Meeting Place: Finger's Restaurant
Day of Month: Second Friday
Time: 7:00 P.M.

Sustaining Members:

Dexter Industries, Inc., Grand Rapids 2, Mich.
Doehler-Jarvis Corp., Grand Rapids, Mich.
Expert Coating Co., Grand Rapids, Mich.
P. B. Gast Co., Grand Rapids, Mich.
Grand Rapids Plating Co., Inc., Grand Rapids 5, Mich.
Hammond Machinery Builders, Inc., Kalamazoo, Mich.
Hanson-Van Winkle-Munning Co., J. C. Miller Div., Grand Rapids, Mich.
Haviland Products Co., Grand Rapids, Mich.
Jervis Corp., Grandville, Mich.
Keeler Brass Co., Grand Rapids, Mich.
Knape & Vogt Mfg. Co., Grand Rapids, Mich.
Michigan Plating & Stamping Co, Grand Rapids 2, Mich.
F. D. Pace Co., Grand Rapids, Mich
Precision Castings Company of Michigan, Kalamazoo, Mich.
Preston Products Co., Grand Rapids 4, Mich.
Roto-Finish Company, Kalamazoo, Mich.

HAMILTON

Secretary: C. Ross MacLeod
40 W. 3rd St., Hamilton, Ontario, Canada
Meeting Place: Fischer's Hotel, Hamilton
Day of Month: Third Friday
Time: 8:15 P.M.

Sustaining Members:

Behr-Manning, Ltd., Brantford, Canada
Dominion Foundries & Steel, Ltd., Hamilton, Ontario, Canada
Westinghouse Corporation of Canada, Ltd., Hamilton, Ontario, Canada

HARTFORD

Secretary: Stanley Platoz
26 Erwin Place, New Britain, Conn.

Meeting Place: Hotel Bond, Hartford, Conn.

Day of Month: Third Monday
Time: 7:45 P.M.

Sustaining Members:
Arrow Hart & Hegeman Electric Company, Hartford 6, Conn.
New England Plating Co., Inc., Worcester, Mass.
Royal Typewriter Company, Hartford, Conn.
The Stanley Works, New Britain, Conn.

HOUSTON

Secretary-Treasurer: George King
Turco Products, 1606 Henderson, Houston, Tex.

Meeting Place: Sonny Looks Cafe

Day of Month: Third Tuesday
Time: 6:30 P.M.

Sustaining Member:
Dixie Electro Plating Company, Houston 3, Texas

INDIANAPOLIS

Secretary: Paul B. Freeman
316 N. Wallace St., Indianapolis, Ind.

Meeting Place: Fox's Steak House, 1207 E. Washington St., Indianapolis, Ind.

Day of Month: First Wednesday
Time: Dinner 6:30—Meeting 8:00 P.M.

Sustaining Members:
Arvin Industries, Inc., Columbus, Ind.
P. R. Mallory & Co., Indianapolis, Ind.

KANSAS CITY

Secretary: Robert L. Garrett
3828 E. 9th St. Ter., Kansas City 27, Mo.

Meeting Place: Berkshire Hotel

Day of Month: Second Thursday
Time: 7:00 P.M.

Sustaining Members:
None

LANCASTER

Secretary-Treasurer: Robert Plaisted
Schick, Inc., Lancaster, Pa.

Meeting Place: Varies

Day of Month: Second Friday
Time: 8:00 P.M.

Sustaining Members:
American Wire Fabrics Corporation, Mt. Wolf, Pa.
Hamilton Watch Company, Lancaster, Pa.

LOS ANGELES

Secretary: Emmett H. Babcock
1308 E. Alvarado, Pomona, Calif.

Meeting Place: Roger Young Auditorium, 926 W. Washington Blvd., Los Angeles, Calif.

Day of Month: Second Wednesday
Time: Dinner 7:00 P.M.—Meeting 8:00 P.M.

Sustaining Members:
Alert Supply Company, Los Angeles 22, Calif.
Associated Plating Co., Los Angeles, Calif.
The Barber-Webb Co., Inc., Los Angeles 58, Calif.
L. H. Butcher Co., Los Angeles 23, Calif.
Crown City Plating Co., El Monte, Calif.
Hall Mack Company, Los Angeles 7, Calif.
Mefford Chemical Co., Los Angeles 22, Calif.
Millhorn Chemical & Supply Co., Los Angeles 1, Calif.
Modern Plating Co., Los Angeles, Calif.
George E. Nichols Plating, Los Angeles, Calif.
Price Pfister Brass Mfg. Co., Los Angeles 31, Calif.
Rheem Automotive Co., Los Angeles, Calif.
Standard Nickel-Chromium Plating Co., Los Angeles, Calif.
Sundmark Supply Co., Los Angeles, Calif.
Surface Alloys Engineering Co., Huntington Park, Calif.
Turco Products, Inc., Los Angeles 54, Calif.

LOUISVILLE

Secretary-Treasurer: Frank E. Wilcher Jr.
4 Westport Ter., Louisville 7, Kentucky

Meeting Place: Hasenours Dining & Cocktail Lounge, 1028 Barrett Ave., Louisville, Kentucky

Day of Month: Third Thursday
Time: Dinner 6:30 P.M.—Meeting 8:00 P.M.

Sustaining Members:
American Radiator & Standard Sanitary Corp., Louisville, Ky.

MELBOURNE

Secretary: P. Major
c/o Glen Walker & Co. Pty., Ltd., 11 Waterloo St., Carlton, Australia

Meeting Place: Metallurgy Theatre, Royal Melbourne Tech. College

Day of Month: Third Thursday
Time: 8:00 P.M.

Sustaining Members:
None

MIAMI

Secretary: A. F. Newlander
2201 S. W. 81st Ave., Miami 44, Florida

Meeting Place: Jerry's Restaurant, Lejuene Road, Miami, Fla.

Day of Month: Last Wednesday
Time: 7:30 P.M.

Sustaining Members:
None

MILWAUKEE

Secretary-Treasurer: Sy Taterzynski
3463 N. Dousman St., Milwaukee 12, Wisc.

Meeting Place: Ambassador Hotel, Milwaukee, Wisc.

Day of Month: First Friday
Time: 8:00 P.M.

Sustaining Members:
Acme Galvanizing, Inc., Milwaukee 15, Wisc.
Allen Bradley Co., Milwaukee 4, Wisc.
Cutler-Hammer, Inc., Milwaukee, Wisc.
Donald Sales & Mfg. Co., Milwaukee 13, Wisc.
Kohler Co., Kohler, Wisc.
Line Material Co., South Milwaukee, Wisc.
Milwaukee Plating Co., Milwaukee 12, Wisc.
John Oster Mfg. Co., Milwaukee 17, Wisc.
Parker Pen Co., Janesville, Wisc.
Perlick Brass Co., Milwaukee, Wisc.
Plating Engineering Co., West Allis 14, Wisc.
Racine Plating Co., Inc., Racine, Wisc.
Square D Company, Milwaukee 12, Wisc.
S. K. Williams Co., Milwaukee 10, Wisc.

MISSISSIPPI VALLEY

Secretary-Treasurer: John Hartman
623 W. 31st St., Davenport, Iowa

Meeting Place: Moline American Legion, Moline, Ill.

Day of Month: Third Wednesday
Time: Dinner 6:30 P.M.—Meeting 8:00 P.M.

Sustaining Members:
Victor Casket Hardware Co., Galesburg, Ill.

MOHAWK VALLEY

Secretary-Treasurer: Charles P. Raehm Jr.
422 Quentin Road, Utica, N. Y.

Sustaining Members:
None

MONTREAL

Secretary-Treasurer: William T. Scott
1430 Dutrisac St., Apt. 5, St. Laurent, Montreal 9, P. Q., Canada

Meeting Place: Mount Royal Hotel, 1455 Peel St., Montreal, P. Q.

Day of Month: First Monday
Time: 8:30 P.M.

Sustaining Members:
Alloycraft, Ltd., Westmont, Montreal, Canada
Northern Electric Co., Ltd., Montreal, Quebec, Canada
Union Screen Plate Co. of Canada, Ltd., Lennoxville, Quebec, Canada

NEWARK

Secretary: D. Gardner Foulke
455 Johnston Drive, Watchung, RFD 3, Plainfield, N. J.

Meeting Place: Robert Treat Hotel

Day of Month: Third Friday
Time: 8:15 P.M.

Sustaining Members:

American Smelting & Refining Co., South Plainfield, N. J.
Bell Telephone Laboratories, Murray Hill, N. J.
Corona Corp., Jersey City, N. J.
Frederick Gumm Chemical Co., Kearny, N. J.
Hanson-Van Winkle-Munning Co. (3), Matawan, N. J.
Hy Grade Electro Plating Co., Newark 7, N. J.
Maas & Waldstein Co., Newark 4, N. J.
Royal Plating & Polishing Co., Inc., Newark 4, N. J.
Sel-Rex Corporation, Nutley 10, N. J.

NEW HAVEN

Secretary-Treasurer: Bernard J. Gaffney
573 Skiff St., North Haven; Conn.

Meeting Place: Mason Laboratory—Yale University

Day of Month: Second Tuesday
Time: 8:00 P.M.

Sustaining Members:

Christie Plating Company, Groton, Conn.
Chromium Process Co., Shelton, Conn.
Enthone, Inc., New Haven 2, Conn.
Lycoming Div., AVCO Mfg. Corp., Stratford, Conn.

NEW YORK

Secretary-Treasurer: Milton Nadel
9-05 162nd St., Whitestone 57, N. Y.

Meeting Place: Hotel Statler

Day of Month: Second and Fourth Fridays
Time: 8:00 P.M.

Sustaining Members:

Allied Chemical & Dye Corp., Mutual Chem. Div., New York 16, N. Y.
Allied Chemical & Dye Corp., National Aniline Div., New York 6, N. Y.
American Zinc Institute (5), New York, N. Y.
Chromium Corporation of America, New York 17, N. Y.
International Nickel Company, Inc. (5), New York, N. Y.
Lea-Ronal, Inc., Jamaica 35, N. Y.
Levco Metal Finishers, Inc., Long Island City 1, N. Y.
Magnuson Products Corp., Brooklyn 2, N. Y.
Metal & Thermit Corp. (2), New York 17, N. Y.
Oakite Products, Inc., New York 6, N. Y.
Sylvania Electric Products, Inc., Flushing, N. Y.

PHILADELPHIA

Secretary: I. William Marcovitch
1302 St. Vincent St., Philadelphia 11, Pa.

Meeting Place: Engineers' Club of Philadelphia, 1317 Spruce St., Philadelphia 7, Pa.

Day of Month: Fourth Monday
Time: 8:00 P.M.

Sustaining Members:

Accurate Electro Plating, Inc., Philadelphia, Pa.
Aetna Electroplating Co., Inc., Philadelphia 11, Pa.
American Chemical Paint Co., Ambler, Pa.
General Plating Co., Trenton, N. J.
Graham, Savage & Associates, Inc., Jenkintown, Pa.
Leeds & Northrup, Philadelphia 44, Pa.
Pennsalt Mfg. Co., Philadelphia, Pa.
Philadelphia Rust Proof Co., Philadelphia 34, Pa.
Progress Mfg. Co., Inc., Philadelphia 34, Pa.
Radio Corporation of America, Camden 2, N. J.
The Reynolds Co., Philadelphia 32, Pa.
Steel Heddle Manufacturing Co., Philadelphia 32, Pa.

PITTSBURGH

Secretary: W. F. Stevens
Mounted Route No. 7, Ellwood City, Pa.

Meeting Place: Gateway Plaza, Pittsburgh, Pa.

Day of Month: First Wednesday
Time: Dinner 6:30 P.M.—Meeting 8:00 P.M.

Sustaining Members:

Aluminum Company of America, New Kensington, Pa.
Rockwell Spring & Axle Co., Standard Steel Spring Div., Coraopolis, Pa.
Weirton Steel Co., Weirton, West Va.
Westinghouse Electric Corp., East Pittsburgh, Pa.

PORTLAND

Secretary-Treasurer: Dale Tweed, Van Waters & Rogers, Inc.
3950 N. W. Yeon Ave., Portland, Oregon

Meeting Place: Ione Plaza

Day of Month: Open
Time: 6:30 P.M.

Sustaining Members:

None

PROVIDENCE-ATTLEBORO

Secretary: William F. Cahill Jr.
14 Sprague St., Greenville, R. I.

Meeting Place: Providence Engineering Society Building, 195 Angell St., Providence, R. I.

Day of Month: Third Monday
Time: 8:00 P.M.

Sustaining Members:

Gorham Manufacturing Co., Providence 7, R. I.
Walton & Lonsbury, Attleboro, Mass.

ROCHESTER

Secretary-Treasurer: Linwood Morrison
1240 Weiland Rd., Rochester 13, N. Y.

Meeting Place: 40 & 8 Club, 933 University Ave., Rochester, N. Y.

Day of Month: Third Monday
Time: 8:00 P.M.

Sustaining Members:

Eastman-Kodak Co. (2), Rochester 4, N. Y.
Stromberg-Carlson Co., Rochester, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Wollensak Optical Co., Rochester, N. Y.

ROCKFORD

Secretary-Treasurer: E. J. Budden
122 12th St., Rockford, Ill.

Meeting Place: Faust Hotel, Rockford, Ill.

Day of Month: Second Monday
Time: 7:00 P.M.

Sustaining Members:

National Lock Co., Rockford, Ill.

SAGINAW VALLEY

Secretary: Charles Melekian
1857 Hosler St., Flint 3, Michigan

Meeting Place: Zehnder, Frankenmuth, Michigan

Day of Month: Second Wednesday
Time: 7:00 P.M.

Sustaining Members:

None

ST. JOSEPH VALLEY

Secretary-Treasurer: Henry A. Meers
2001 Bergan St., South Bend, Ind.

Meeting Place: Lincoln Highway Inn, Mishawaka, Ind.

Day of Month: First Wednesday
Time: Dinner 6:30 P.M.—Technical Session 8:00 P.M.

Sustaining Members:

Bendix Aviation Corp., Bendix Prods. Div., South Bend 20, Ind.
Rockwell Spring & Axle Co., Newton Falls, Ohio
Roth Plating Corporation, South Bend, Ind.
Standard Plating Works, Inc., Goshen, Ind.
The Studebaker-Packard Corp., South Bend, Ind.

ST. LOUIS

Secretary-Treasurer: Ward W. Kelly
7046 Deerpath Drive, St. Louis 23, Mo.

Meeting Place: York Hotel, 2822 LaSalle St., St. Louis 4, Mo.

Day of Month: Second Wednesday
Time: 7:00 P.M.

Sustaining Members:

American Zinc Sales Co., St. Louis, Mo.
Bussman Mfg. Co., St. Louis, Mo.
Chandeysson Electric Co., St. Louis, Mo.
Davies Supply & Mfg. Co., St. Louis 16, Mo.
Folding Carrier Corp., Oklahoma City, Okla.
C. Hager & Sons Hinge Mfg. Co., St. Louis 5, Mo.
Knapp-Monarch Co., St. Louis 16, Mo.
Lasalco, Inc., St. Louis 4, Mo.
Maurer Supply Co., St. Louis, Mo.
National Rejectors, Inc., St. Louis 15, Mo.
G. S. Robins Co., St. Louis 2, Mo.
Sommers Brothers Mfg. Co., St. Louis 7, Mo.

SAN ANTONIO

Secretary-Treasurer: Robert C. Cripe
2209 Texas Ave., San Antonio, Texas

Meeting Place: DeWinne's Belgium Inn, 3119 W. Commerce St., San Antonio, Texas

Day of Month: Third Monday
Time: Dinner 6:30 P.M.—Program 8:00 P.M.
Sustaining Members:
None

SAN FRANCISCO

Secretary: Arthur E. Schwartz, L. H. Butcher Co.
15th & Vermont St., San Francisco, Cal.
Meeting Place: Pastori's Restaurant, 2550 El Camino Real, Redwood City, Calif.
Day of Month: Second Thursday
Time: 7:30 P.M.
Sustaining Members:
None

SEATTLE-PUGET SOUND

Secretary: William P. Foley
Route No. 1, Box 833, Kent, Wash.
Meeting Place: College Club, 6th & Spring Sts., Seattle, Wash.
Day of Month: Third Tuesday (Flexible)
Time: Dinner 7:00 P.M.—Meeting 8:00 P.M.
Sustaining Members:
None

SOUTHEASTERN

Secretary-Treasurer: Robert H. Probert
1078 Washington St., S. W., Atlanta, Ga.
Meeting Place: Belmont Steak House, Downtown Luckie St., Atlanta, Ga.
Day of Month: Second Friday
Time: 7:30 P.M.
Sustaining Member:
Production Plating Company, Adel, Ga.

SOUTHERN TIER

Secretary-Treasurer: Bill Rossiter
5 Ellen St., Rt. 97, Binghamton, N. Y.
Meeting Place: Ah-wa-ga Hotel, Owego, N. Y.
and
Forest House, Athens, Pa.
Day of Month: Third Tuesday
Time: 7:30 P.M.
Sustaining Members:
International Business Machine Corp., Endicott, N. Y.

SPRINGFIELD

Secretary: Henry L. Heissfeld
74 Chilson St., Springfield, Mass.
Meeting Place: Blake's Restaurant, 15 Market St., Springfield, Mass.
Day of Month: Fourth Monday
Time: Dinner 7:00 P.M.—Technical Session 8:00 P.M.
Sustaining Members:
The Chemical Corporation, Springfield, Mass.
Moore Drop Forging Co., Springfield, Mass.

SYDNEY

Secretary-Treasurer: E. A. McAloon
65 Onslow St., Rosebay, N. S. W., Australia
Meeting Place: Trust Building, Martin Place & Castlereigh St.
Day of Month: Second Thursday
Time: 7:30 P.M.
Sustaining Members:
None

SYRACUSE

Secretary: Milton F. Stevenson
313 Beech St., North Syracuse 12, N. Y.
Meeting Place: Turn Hall, 619 N. Salina St., Syracuse, N. Y.
Day of Month: Third Monday
Time: Dinner 6:30 P.M.—Meeting 8:00 P.M.
Sustaining Members:
Oneida, Ltd., Oneida, N. Y.

TOLEDO

Secretary: Ben Gomersall
6015 Anthony Wayne Trail, Route 1, Maumee, Ohio
Meeting Place: Angelo's Spaghetti House, Stickney Ave., Toledo, Ohio
Day of Month: First Thursday
Time: Dinner Meeting 6:30 P.M.
Business Meeting 8:00 P.M.
Sustaining Member:
The Electric Auto-Lite Co. (2), Sharonville 8, Ohio

TORONTO

Secretary-Treasurer: E. F. Hutt
85 Barford Rd., Rexdale, Ontario, Canada
Meeting Place: Royal York Hotel, Toronto, Ontario, Canada
Day of Month: Second Friday
Time: Dinner 6:30 P.M.—Meeting 8:30 P.M.
Sustaining Members:
Armalite Company, Ltd., Toronto, Ontario, Canada
Bomac Electrotype Co., Ltd., Toronto, Ontario, Canada
British Chrome & Chemicals (Canada) Ltd., Toronto 5, Ontario, Canada
Canada Cycle & Motor Co., Ltd., Weston, Ontario, Canada
Canadian Hanson & Van Winkle Co., Ltd., Toronto, Ontario, Canada
General Motors of Canada, Ltd., Oshawa, Ontario, Canada
Houdaille Industries of Canada, Ltd., Oshawa, Ontario, Canada
International Nickel Co. of Canada, Ltd., Toronto, Ontario, Canada
Lea Manufacturing Co. of Canada, Ltd., Scarborough, Ontario, Canada
Metal & Thermit—United Chromium of Canada, Ltd., Rexdale, Ontario, Canada
W. W. Wells, Ltd., Scarborough, Ontario, Canada

TWIN CITY

Secretary-Treasurer: Robert L. Buckley
205 11th Ave., South, Minneapolis 15, Minn.
Meeting Place: Jax Cafe
Day of Month: First Monday
Time: 7:00 P.M.
Sustaining Members:
None

WATERBURY

Secretary-Treasurer: Albert G. Griffith
94 Ridgeview Place, Cheshire, Conn.
Meeting Place: Colonial Room, Roger Smith-Elton Hotel
Day of Month: Second Thursday
Time: Dinner 6:00 P.M.—Meeting 8:00 P.M.
Sustaining Members:
All Brite Chemical Co., Watertown, Conn.
American Brass Company, Waterbury 20, Conn.
American Electro Products, Inc., Waterbury, Conn.
Apothecaries-Hall Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury 91, Conn.
Eastern Electroplating Co., Terryville, Conn.
Harper Leader, Inc., Waterbury 20, Conn.
The International Silver Co., Meriden, Conn.
The Lea Mfg. Co., Waterbury 20, Conn.
W. D. MacDermid Chemical Co., Bristol, Conn.
MacDermid, Inc., Waterbury 20, Conn.
The Patent Button Co., Waterbury 2, Conn.
Scovill Manufacturing Co., Waterbury, Conn.
Seymour Mfg. Co., Seymour, Conn.
The Summit Finishing Co., Inc., Thomaston, Conn.
The Waterbury Plating Co., Waterbury 86, Conn.
Whyco Chromium Co., Inc., Thomaston, Conn.

WESTERN ONTARIO

Secretary-Treasurer: R. A. Campbell
268 Cecil St., Sarnia, Ontario, Canada
Meeting Place: William Pitt Hotel, Chatham, Ontario, Canada
Day of Month: Third Friday
Time: 6:30 P.M.—Dinner-Meeting
Sustaining Members:
Bendix Eclipse of Canada, Ltd., Windsor, Ontario, Canada
Canadian Motor Lamp Co., Ltd., Windsor, Ontario, Canada
Ontario Steel Products Co., Ltd., Chatham, Ontario, Canada

WICHITA

Secretary: Estel E. Starr
1685 Elpyco, Wichita 9, Kansas
Meeting Place: Oriental Restaurant, 5405 E. Central, Wichita, Kans.
Day of Month: Fourth Wednesday
Time: 6:00 P.M.
Sustaining Members:
Continental Can Company, Inc., Coffeyville, Kansas

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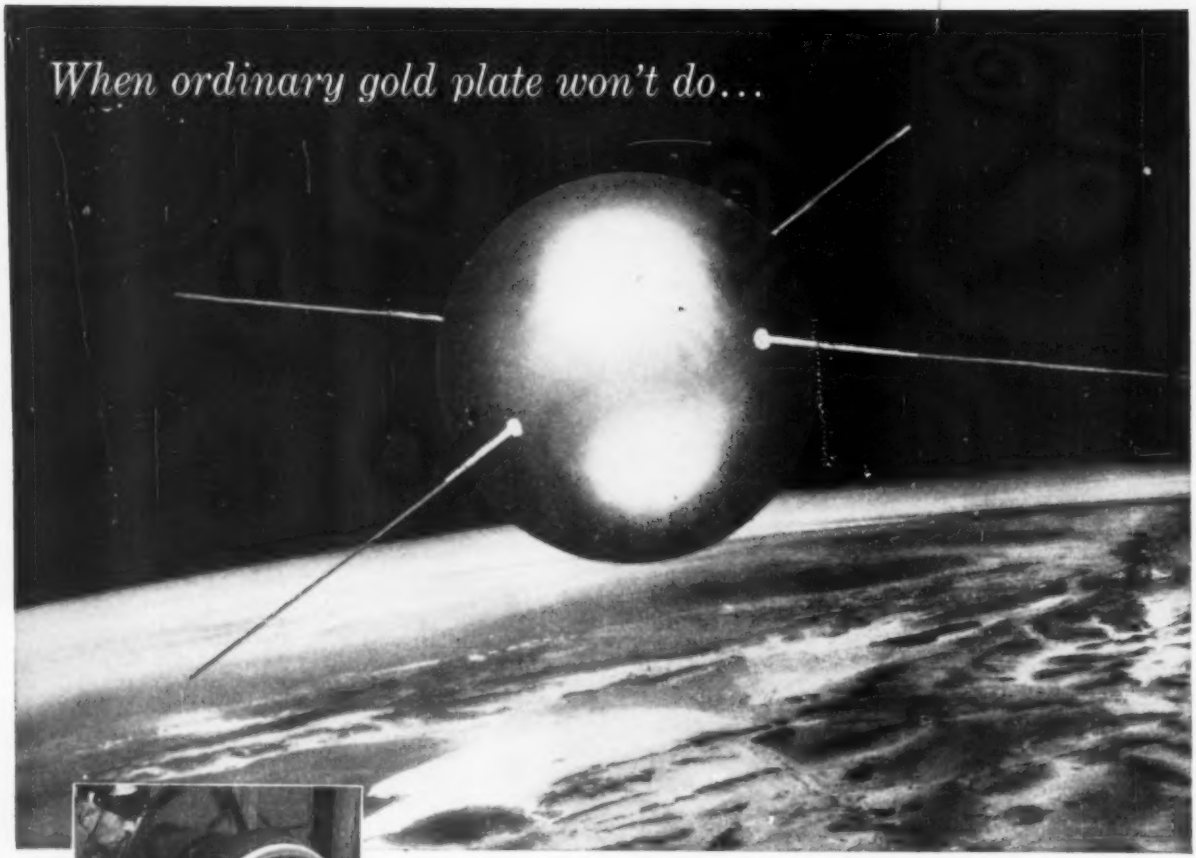
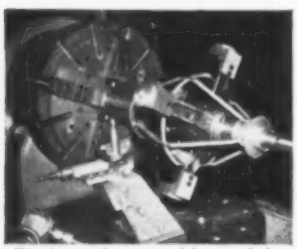
When ordinary gold plate won't do...



Basic structure of the Satellite consists of two hemispheres which are spun to exact contour. They are made of Magnesium alloy.

An inner ring forms a pressure-tight circular chamber in the finished hemisphere. Cross-section view shows the resulting pressure cavity.



The internal structural frame of the Satellite is chiefly Magnesium tubing. This is also plated with Sel-Rex Bright Gold.

EARTH SATELLITE PLATED WITH SEL-REX BRIGHT GOLD

To provide maximum heat reflectivity and emissivity, The United States IGY Earth Satellites have been plated with Sel-Rex Bright Gold Process underneath their final coatings. This patented formulation was also used to plate most internal parts and instrument housings for temperature control.

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The Earth Satellites have been made of Magnesium, and plated with Sel-Rex Bright Gold, by Brooks & Perkins, Inc., the country's leading independent producer and fabricator of Magnesium.

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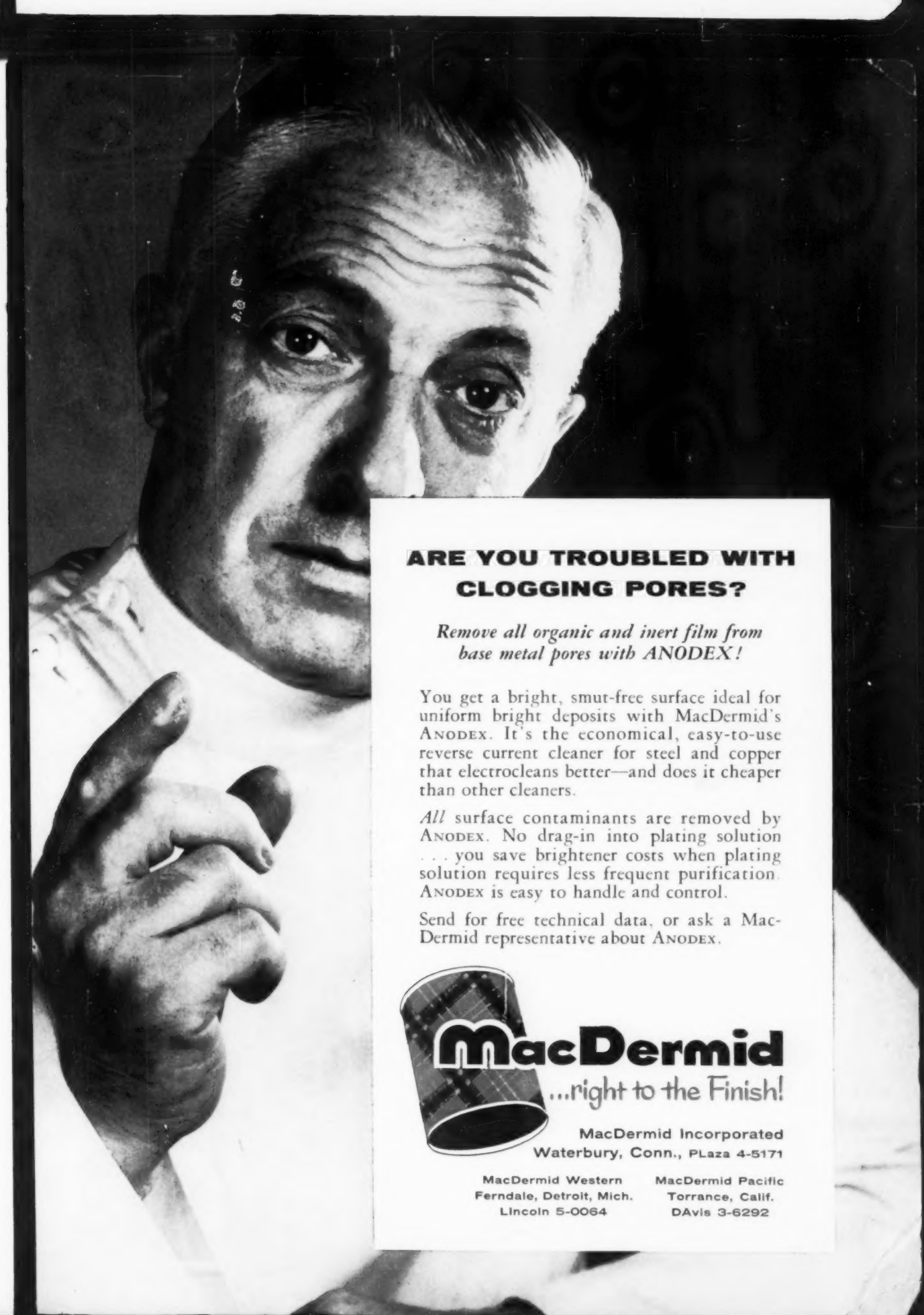

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DAvis 3-6292

New! ...from H-VW-M

NI-PLEX A FAST, LOW-COST NICKEL STRIPPING COMPOUND that's EASY on basis metals

Just one NI-PLEX bath strips nickel or cadmium quickly, completely from steel, copper, brass, silver or aluminum—without injuring the basis metal!

UNRETOUCHED PHOTO of wrench plated with H-VW-M Nickel-Lume and chrome. Lower half was stripped with new NI-PLEX. Note clean, clear surface of basis metal—no pitting, no rough spots, no rounded corners!

NO CYANIDES, CAUSTICS, ACIDS OR CURRENT . . . and no noxious fumes! New Ni-Plex won't cause corrosion or pitting . . . tests prove it's the *only* effective nickel stripper that's safe for parts containing two or more basic metals.

NI-PLEX SAVES YOU MONEY! Ni-Plex *stays* laboratory-fresh, delivers 100% efficiency in closed tanks, keeps its stability even at high temperatures. Result: Ni-Plex costs average better than *1¢ less than other stripping compounds for every square foot* of 0.0001" nickel stripped! What's more, nickel can be reclaimed when Ni-Plex is used.

NO PILE-UP OF REJECTS waiting for a "custom-made" bath! Ni-Plex's *versatility* and *stability* mean you can keep an all-purpose bath standing by, in a clean, covered tank—ready to use as you need it.

EASY TO PREPARE! Just mix with water, following simple instructions. Use Ni-Plex for stripping racks, too!

DON'T MISS THIS OPPORTUNITY to discover for yourself how new NI-PLEX can solve your nickel stripping problems. Clip the coupon below, and drop it in the mail, today, along with $4.00 for a quantity of NI-PLEX sufficient to make a 1-gallon bath. Try it—and compare the results! Hanson-Van Winkle-Munning Company, Matawan, New Jersey. Offices in principal cities.

MAIL THIS COUPON TODAY....

HANSON-VAN WINKLE-MUNNING CO.
Matawan, New Jersey
Att. J. W. Carton

Please send us parcel post prepaid enough NI-PLEX for a 1-gallon bath, along with complete instructions.

☐ $4.00 Check enclosed
☐ Purchase order enclosed

Company_____

Address_____

Attention of_____

H-VW-M

PLATEMANSHIP—Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

4545

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

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